



CITY
ENGINEERING COLLEGE

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE
LEARNING**

CIRCULAR

RefNo: CEC/AIML/DAC/ACY 2022-2023/02

Date: 1-02-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 8-02-2023 at 11: 00 AM in HOD's office AIML Department.

Agenda:

- The committee discussed various strategies to increase student.
- Faculty to design project guidelines and assessment criteria.
- Exposure to Usage of Tools in Courses of the Semester.
- Internship and Project Opportunities for Students.
- Organize hackathons, project exhibitions.

CC TO

1. PRINCIPAL OFFICE-CEC
2. All Members

Vagdekar
HOD

HOD

Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off) Kanakapura Road,
Bangalore-560061



CITY
ENGINEERING COLLEGE

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE
LEARNING**

Department Advisory Committee Meeting

Date: 8/02/2023

Time: 11:00 AM

Venue: HOD's office

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Dr. S Vagdevi	HOD	Convenor, HOD	
2	Mr. Subhash Murugesan	Founder, Aero knotz Drones India Private Limited	Industry Expert	
3	Dr. Prakash S	Associate Professor, Department of ISE, RNSIT.	Member	
4	Dr. C Ramchandra	Associate professor	Member	
5	Mrs. Vindhya R	Assistant Professor	Member	

The Department Advisory Committee meeting was conducted in Department of AIML, on 16th February, 2023, at 11 AM.

Agenda of the Meeting:

- The committee discussed various strategies to increase student .
- Faculty to design project guidelines and assessment criteria.
- Exposure to Usage of Tools in Courses of the Semester.
- Internship and Project Opportunities for Students.
- Organize hackathons, project exhibitions.



CITY
ENGINEERING COLLEGE

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- The need for students to gain hands-on experience with industry-standard tools and software was discussed.
- Possible tools and software relevant to each course were identified.
- The committee discussed various strategies to increase student engagement, including the use of interactive learning platforms, gamification, and collaborative projects.

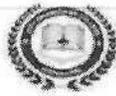
Dr. S Vagdevi

HOD



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 Even SEM

	May2023		June 2023		July 2023		Aug 2023		Sept 2023	
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON	1									
TUE	2						1			
WED	3						2			
THU	4		1				3			
FRI	5		2				4		1	Start of II sem Practical
SAT	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday	5	1st Saturday holiday	2	1st Saturday holiday
SUN	7		4		2		6		3	
MON	8		5	4th sem start 8th sem Practical	3		7		4	
TUE	9		6		4		8		5	
WED	10		7		5		9		6	
THU	11		8		6		10		7	
FRI	12		9		7		11		8	
SAT	13		10		8		12		9	II sem last working day
SUN	14		11		9		13		10	
MON	15		12		10	VI SEM LAST WORING day	14		11	Start of II sem Practical
TUE	16	8th sem theory exam	13		11	6TH sem practical exam	15	Independence day	12	
WED	17		14		12		16		13	
THU	18	8th sem theory exam	15		13		17		14	
FRI	19		16		14		18		15	IV sem last working day
SAT	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday	19	3rd Saturday holiday	16	3rd Saturday holiday
SUN	21		18		16		20		17	
MON	22		19		17		21		18	Ganesha festival
TUE	23		20		18		22		19	Start of IV sem Practical
WED	24		21		19		23		20	
THU	25	II SEM START IV sem Internship	22		20		24		21	Start of II sem Theory exam
FRI	26		23		21		25		22	
SAT	27		24		22		26		23	
SUN	28		25		23		27		24	
MON	29		26		24	6TH sem Theory exam	28		25	
TUE	30		27		25		29		26	
WED	31		28		26		30		27	
THU			29	Bakrid	27		31		28	Id Milad
FRI			30		28				29	
SAT					29	Moharam			30	
SUN					30				31	
MON					31				3/10	Start of IV sem Theory



CITY ENGINEERING COLLEGE

Department of AIML

COE- 2022-23 - 6th SEM

DAY	March 2023		April 2023		May 2023		June 2023		July 2023	
	Date		Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	May day				
TUE					2					
WED	1				3	6 th Sem – I CIE				
THU	2				4					
FRI	3				5		1			
SAT	4				6		2			
SUN	5		1	1st Saturday holiday	7	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday
MON	6		2		8		4		2	
TUE	7		3		9		5	6 th Sem – II CIE	3	
WED	8		4		10		6		4	
THU	9		5		11		7		5	
FRI	10		6		12	Good Friday	8		6	
SAT	11		7		13		9		7	6 th Sem – III CIE
SUN	12		8		14		10	6 th Sem - PTM	8	
MON	13		9		15		11		9	
TUE	14		10		16		12		10	6 th Sem Last Working Day
WED	15		11		17	8 th sem theory exam	13		11	6 th sem practical exam
THU	16		12		18	IV sem Internship	14		12	
FRI	17		13		19	8 th sem theory exam	15		13	
SAT	18		14	Ambedkar Jayanthi	20		16		14	
SUN	19		15	3rd Saturday holiday	21	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday
MON	20	6 th Sem Starts	16		22		18		16	
TUE	21		17		23		19		17	
WED	22	Ugadi	18		24		20		18	
THU	23		19		25		21		19	
FRI	24		20		26		22		20	
SAT	25		21		27		23		21	
SUN	26		22	Ramzan	28		24		22	
MON	27	VI sem orientation	23		29		25		23	
TUE	28	Sports and	24		30		26		24	6 th sem Theory exam
WED	29	Cultural Events	25		31		27		25	
THU	30	Ethnic Day	26				28		26	
FRI	31		27				29	Bakrid	27	
SAT			28				30		28	
SUN			29						29	Moharam
MON			30						30	
									31	

Vegdees
HOD



Department of Artificial Intelligence and Machine Learning

Subject Allotment: EVEN SEMESTER

Academic Year-2022-23

SL. NO.	Name of the Faculty	Course code and name	Year /semester	Signature
1	Dr. S Vagdevi	18AI61-Machine Learning 18AIL66-Machine Learning Lab 18AIL68-Mobile Application Development Lab.	3 rd /6 th 3 rd /6 th 3 rd /6 th	
2	Dr. C Ramachandra	18AI62-Digital Image processing	3 rd /6 th	
3	Mr. Nandish A C	21UH49-Universal Human Values	2 nd /4 th	
4	Mrs. Vindhya	18AI644-Foundation for Data Science. 18AIL66-Machine Learning Lab 21CS482-R Programming	3 rd /6 th 3 rd /6 th 2 nd /4 th	
5	Mr. Shivashankara N	18AI63-Java for Mobile Applications. 18AIL67-Digital Image processing Lab.	3 rd /6 th	
6	Mrs. Soumya	18AIL67-Digital Image processing Lab 21CS44-Operating Systems. 21CS482-R Programming	3 rd /6 th 2 nd /4 th 2 nd /4 th	
7	Mrs. Salika Fathima	21CS42-Design and Analysis of Algorithm. 21CSL46-Python Programming Laboratory. 18AIL68-Mobile Application Development Lab.	2 nd /4 th 2 nd /4 th 3 rd /6 th	
8	Mr. Suhas	21CS43-Microcontroller and Embedded Systems. 21CS482-R Programming	2 nd /4 th 2 nd /4 th	
9	Ms. Arshiya Fathima	BPOPS203-Principles of Programming using C	1 st /2 nd	

Dr. S Vagdevi

HOD
HOD

Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off) Kanakapura Road,
Bangalore-560061



CITY ENGINEERING COLLEGE

Department of AI & ML

IV SEM

Time Table for EVEN SEM AY 2022-2023

W.E.F.05/06/2023

Room:304

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 AM	12:15 – 01:15PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM	
MON	PYTHON(A1) / MES(A2) LAB		Short Break	CIP	MATHS	Lunch Break	R TUTORIALS			
TUE	DAA	MATHS		OS	UHV		PYTHON (T)	AE LAB A1		
WED	DAA(A1)/ PYTHON (A2) LAB			DAA	MES		OS	MATHS		
THU	MATHS	OS		BIO	PYTHON(T)		MES	AE LAB A2		
FRI	OS	BIO		MES	DAA		MES (A1)/ DAA(A2) LAB			
SAT	MAT DIP			INTERNSHIP PRESENTATION						

Sl. No	Course Code	Course Name	Course	Faculty Name
1	21CS41	Mathematical foundations for computing	COURSE	
2	21CS42	Design and Analysis of Algorithm	MATHS	Ms. Vanitha
3	21CS43	Microcontroller and Embedded Systems	DAA	Mrs Salika Fathima
4	21CS44	Operating Systems	MES	Mr. SUHAS
5	21BE45	Biology for engineers	OS	Mrs. Soumya
6	21CSL46	Python programming laboratory	BIO	
7	21CIP47	Constitution of India and professional ethics	PYTHON	Mrs Vindhya/ Mr. Shivshankar/ Mrs. Salika Fathima
8	21CS482	Ability Enhancement Course (R Programming)	CIP	
9	21UH49	Universal Human Values		Mrs Vindhya R/ Mr. SUHAS /Mrs Soumya
10	21MATDIP41	Additional Math's-I	UHV	Mr. Nandish A C
11		DAA LAB	MATDIP	Mrs. Rekha/ Mrs. Vanitha
12		MES LAB		Mr. Salika Fathima / Mrs. Soumya/
				MR. SUHAS S

Class Teacher:

HOD
 Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
 Doddanahalli (KT) Kanakapura Road,
 Bangalore-560061

Principal
CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061



CITY ENGINEERING COLLEGE

Department of AI & ML

VI SEM

Time Table for EVEN SEM AY 2022-2023

W.E.F: 20/03/2023

Room:403

DAY	09:00- 10:00 AM	10:00 - 11:00 AM	11:15- 12:15 AM	12:15 - 01:15PM	02:00 - 03:00 PM	03:00 - 04:00 PM	04:00 - 05:00 PM
MON	18ME651 NCE	18AI644 FDS	18AIL66(T) ML LAB(T)	18AIL68(T) MAD (T)	18AIL67(T) DIP LAB(T)	18AI63 JMA	
TUE	18AIL67(L) DIP LAB		18AI61 ML		18AI62 DIP	18AI63 JMA	18AIL67(T) DIP LAB (T)
WED	18AI62 DIP	18ME651 NCE	18AI61 ML	18AI62 DIP	18AIL68(T) MAD LAB(T)	18AIL68 MAD LAB	
THU	18AI63 SN	18ME651 NCE	18AI61 ML		18AI644 FDS	18AIL66(T) ML LAB(T)	18AI63(T) JMA
FRI	18AI62(T) DIP (T)	18AI644 FDS	18AIL66 ML LAB		18AI62(T) DIP(T)	18AI63(T) JMA	
SAT	18AIL68	18AI644	(MINI PROJECT)		MINI PROJECT		

Sl. No	Course Code	Course Name	Course	Faculty Name
1	18AI61	MACHINE LEARNING	ML	Dr S Vagdevi
2	18AI62	DIGITAL IMAGE PROCESSING	DIP	Dr C Ramachandra
3	18AI63	JAVA FOR MOBILE APPLICATIONS	JMA	Shivashankara N
4	18AI644	FOUNDATIONS FOR DATA SCIENCE	FDS	Mrs Vindhya R
5	18ME651	NON-CONVENTIONAL ENERGY	NCE	Mr Harshavardhan
6	18AIL66	MACHINE LEARNING LAB	ML LAB	Dr S Vagdevi/Mrs Vindhya R/
7	18AIL67	DIGITAL IMAGE PROCESSING LAB	DIP LAB	Dr C Ramachandra /Mr Shivashankara N/Soumya
8	18AIL68	MOBILE APPLICATION DEVELOPMENT LAB	MAD LAB	Dr S Vagdevi /Mr Shivashankara N/Salika Fathima

Class Teacher:

HOD
 Dept of Artificial Intelligence & Machine Learning
 CITY ENGINEERING COLLEGE
 Doddakallasandra, (C) Hanakapura Road,
 Bangalore-560061

Skandan

Principal
 PRINCIPAL
CITY ENGINEERING COLLEGE
 Hanakapura Main Road, BANGALORE - 560 061

COURSE FILE

AY 2022-2023 EVEN SEMESTER

Name: Dr. S Vagdevi

Designation: HOD AIML Department

Subject: 18AI61

Subject Name : Machine Learning



CITY ENGINEERING COLLEGE

Department of AI & ML

INDIVIDUAL TIME

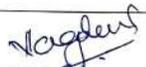
Time Table for EVEN SEM AY 2022-2023

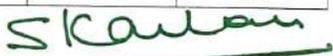
Faculty: Dr S Vagdevi

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15 – 12:15 AM	12:15 – 01:15PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM	
MON			Short Break	PLC		Lunch Break	18AIMP68(T)	18AI61(T)		
TUE					PLC			PLC LAB A1 BATCH		
WED				18AI61 ML	18AI61(T)			18AIMP68(T)	18AIMP68 MAD LAB	
THU				18AI61 ML	18AI61 ML			18AIL66 (T) ML LAB		
FRI				18AIL66 ML LAB						
SAT										

Sl. No	Course Code	Course Name	THEORY	TUTORIALS	PRACTICALS	UNITS
1	18AI61	MACHINE LEARNING	3	2		5
2	18AIL66	MACHINE LEARNING LAB		2	2	3
3	18AMP68	MOBILE APPLICATION DEVELOPMENT LAB		2	2	3
4	BPLCK205B	INTRODUCTION TO PYTHON PROGRAMMING	2			2
5	18AMP68	MAD MINI PROJECT (3 BATCHES)				3
					TOTAL	16


Class Teacher:


HOD
Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off: Kanakapura Road,
Bangalore-560061


Principal
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Artificial Intelligence and Machine Learning (AI)
 Scheme of Teaching and Examinations
 Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
 (Effective from the academic year 2018 - 19)

VI SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination			Credits		
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks		Total Marks	
					L	T	P						
1	PCC	18AI61	Machine Learning	CS / IS / AI	3	2	--	03	40	60	100	4	
2	PCC	18AI62	Digital Image Processing	CS / IS / AI	3	2	--	03	40	60	100	4	
3	PCC	18AI63	Java for Mobile Applications	CS / IS / AI	3	2	--	03	40	60	100	4	
4	PEC	18AI64X	Professional Elective -I	CS / IS / AI	3	--	--	03	40	60	100	3	
5	OEC	18AI65X	Open Elective -A	CS / IS / AI	3	--	--	03	40	60	100	3	
6	PCC	18AIL66	Machine Learning Laboratory	CS / IS / AI	--	2	2	03	40	60	100	2	
7	PCC	18AIL67	Digital Image Processing Laboratory with mini project	CS / IS / Ai	--	2	2	03	40	60	100	2	
8	MP	18AIL68	Mobile Application Development Laboratory	CS / IS / AI	--	2	2	03	40	60	100	2	
9	INT	--	Internship	(To be carried out during the intervening vacations of VI and VII semesters)				--	--	--	--	--	--
TOTAL					15	12	6	24	320	480	800	24	

Note: PCC: Professional core, PEC: Professional Elective, OE: Open Elective, MP: Mini-project, INT: Internship.

Professional Elective - I	
Course code under 18XX64X	Course Title
18AI641	Natural Language Processing
18AI642	Software Project and Management
18AI643	Web Programming
18AI644	Foundation for Data Science
Open Elective -A (18CS65x are not to be opted by CSE / ISE /AIML Programs)	
18CS651	Mobile Application Development
18CS652	Introduction to Data Structures and Algorithms
18CS653	Programming in JAVA
18CS654	Introduction to Operating System

Students can select any one of the open electives offered by any Department (Please refer to the list of open electives under 18CS65X). Selection of an open elective is not allowed provided,

- The candidate has studied the same course during the previous semesters of the programme.
- The syllabus content of open elective is similar to that of Departmental core courses or professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.

Registration to electives shall be documented under the guidance of Programme Coordinator/ Adviser/Mentor.

Mini-project work: Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini- project can be assigned to an individual student or to a group having not more than 4 students.

CIE procedure for Mini project:

(i) **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the Mini-project work, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

(ii) **Interdisciplinary:** Continuous Internal Evaluation shall be group wise at the college level with the participation of all the guides of the college. The CIE marks awarded for the Mini-project, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

SEE for Mini project:

(i) **Single discipline:** Contribution to the Mini-project and the performance of each group member shall be assessed individually in the semester end examination (SEE) conducted at the department.

(ii) **Interdisciplinary:** Contribution to the Mini-project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted separately at the departments to which the student/s belong to.

Internship: All the students admitted to III year of BE/B. Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not takeup/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

MACHINE LEARNING
(Effective from the academic year 2018 -2019)
SEMESTER – VI

Subject Code	18AI61	CIE Marks	40
Number of Contact Hours/Week	3:2:0	SEE Marks	60
Total Number of Contact Hours	50	Exam Hours	3 Hrs

CREDITS – 04

Course Learning Objectives: This course will enable students to:

- Define machine learning and understand the basic theory underlying machine learning.
- Differentiate supervised, unsupervised and reinforcement learning
- Understand the basic concepts of learning and decision trees.
- Understand Bayesian techniques for problems appear in machine learning
- Perform statistical analysis of machine learning techniques.

Module – 1

Introduction:

Machine learning Landscape: what is ML?, Why, Types of ML, main challenges of ML (T2:Chapter1)
Concept learning and Learning Problems – Designing Learning systems, Perspectives and Issues –
Concept Learning – Find S-Version Spaces and Candidate Elimination Algorithm –Remarks on VS-
Inductive bias –

T2: Chapter 1

T1: Chapter 1 and 2)

CH

10

Module – 2

End to end Machine learning Project :

Working with real data, Look at the big picture, Get the data, Discover and visualize the data,
Prepare the data, select and train the model, Fine tune your model

Classification : MNIST, training a Binary classifier, performance measure, multiclass
classification, error analysis, multi label classification, multi output classification
(T2: Chapter 2 and 3)

10

Module – 3

Training Models: Linear regression, gradient descent, polynomial regression, learning curves,
regularized linear models, logistic regression

Support Vector Machine: linear, Nonlinear , SVM regression and under the hood
(T2: Chapter 4 and 5)

RBT: L1, L2

10

Module – 4

Decision Trees

Training and Visualizing DT, making prediction, estimating class, the CART training,
computational complexity, GINI impurity, Entropy, regularization Hyper parameters, Regression,
instability

Ensemble learning and Random Forest:

Voting classifiers, Bagging and pasting, Random patches, Random forests, Boosting, stacking
(T2: Chapter 6 and 7)

RBT: L1, L2

10

Module – 5

Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length
Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier– example-
Bayesian Belief Network – EM Algorithm

Text book (T1: Chapter 6)

RBT: L1, L2

10

Course outcomes: The students should be able to:

- Choose the learning techniques with this basic knowledge.
- Apply effectively ML algorithms for appropriate applications.
- Apply bayesian techniques and derive effectively learning rules.

Question Paper Pattern:

- The question paper will have ten questions.
- Each full Question consisting of 20 marks
- There will be 2 full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer 5 full questions, selecting one full question from each module.

Textbooks:

1. Tom M. Mitchell, Machine Learning, McGraw-Hill Education, 2013
2. AurelienGeron, Hands-on Machine Learning with Scikit-Learn &TensorFlow , O'Reilly, Shroff Publishers and Distributors pvt.Ltd 2019

Reference Books:

1. EthemAlpaydin, Introduction to Machine Learning, PHI Learning Pvt. Ltd, 2nd Ed., 2013
2. T. Hastie, R. Tibshirani, J. H. Friedman, The Elements of Statistical Learning, Springer, 1st edition, 2001
3. Machine Learning using Python ,Manaranjan Pradhan, U Dinesh kumar, Wiley, 2019
4. Machine Learning, SaikatDutt, Subramanian Chandramouli, Amit Kumar Das, Pearson,2020

LESSON PLAN

Contact hours per week 3:2:0

Week	Date		Topics Planned
	From	To	
I	20/3/23	31/3/23 mod 1	Machine learning landscape: what is ML? why? Types of ML. Case studies and applications.
II	3/4/23	8/4/23	Main challenges of ML. Concept learning and learning pbs. Designing learning systems. 3 pbs.
III	10/4/23	15/4/23	Perspective and learning issues: Concept learning - Find S Algo. and pbs on diff. data sets.
IV	17/4/23	22/4/23	Version spaces, list then eliminate algo and candidate elimination ^{VTU's} algo. Pbs. on diff. data sets from
V	24/4/23	29/4/23 mod 2	End to End ML project: Working with real data, look at the Big Picture, Get the data, Discover data
VI	1/5/23	6/5/23	Visualise data, Prepare the data Select and train the model, Fine tune your model. IA1 - 3/5, 4/5, 5/5.
VII	8/5/23	13/5/23	classification: MNIST, Using a binary classifier, Performance measure, multiclass & Multilabel, error analysis and output classificat
VIII	15/5/23	20/5/23 Module 3	Training models: Linear, regression, Gradient descent, polynomial reg. learning curves regularised and logistic regression.

Start date: 20/3/2023 End date: 10/7/2023.

LESSON PLAN

28/3/23 to 31/3/23
college day activities

Week	Date		Topics Planned
	From	To	
IX	22/5/23	27/5/23	SVM, linear and non linear, ^{VTU} SVM regression. Pbs on models, regression and on using data sets.
X	29/5/23	3/6/23 ^{mod 4 ✓}	Decision trees: Training and visualisation DT, prediction, estimate class, CART training, computational complexity.
XI	5/6/23	10/6/23	GINI impurity, Entropy, regularization hyper parameters, Regression instability. IA2: 8/6, 9/6, 10/6.
XII	12/6/23	17/6/23	Ensemble learning and Random forest: Voting classifiers, Bagging and boosting, patches, Boosting, stacking
XIII	19/6/23	24/6/23 ^{mod 5 ✓}	Bayes Theorem: concept learning - Maximum likelihood - Minimum Description length Principle & associated QP Pbs.
XIV	26/6/23	1/7/23	Bayes optimal classifier, Gibbs algorithm, Naive Bayes classifier, example. Bayesian Belief NW, EM algorithm.
XV	3/7/23	8/7/23	IA-3
XVI	10/7/23		IA marks Finalisation & Signatures.

Vagdevi S
Teacher's Signature

Vagdevi S
HOD'S Signature

USN 1 C E 2 0 A 1 0 0

COURSE CODE : 18AI61

CITY ENGINEERING COLLEGE
Kanakapura Road, Doddakallasandra, Bengaluru - 560062
FIRST INTERNAL TEST

Programme: Artificial Intelligence & Machine Learning
 Course Name: MACHINE LEARNING
 Sem: 6
 Duration: 1 ½ Hrs

Date: 03/05/2023
 Time: 10:30AM – 12:00 Noon

MAX MARKS: 50

Note: 1) PART C AND PART D ARE COMPULSORY
 2) Answer any ONE full question from PART A, B & E

		Marks	CO 1	BTL
Part A				
1a)	What is a well-posed learning problem? Explain with an example.	2+3 =5	CO1	BTL 2
1b)	Explain the various stages involved in designing a learning system	5	CO1	BTL 2
Or				
2a)	Why use Machine Learning? What are the types of Machine learning systems?	2+3 =5	CO1	BTL-2
2b)	Discuss the main challenges of machine learning	5	CO1	BTL-2
Part B				
3a)	Discuss the features of an unbiased Learner	5	CO1	BTL-2
3b)	State the following problems with respect to Tasks, Performance, and Experience: i) Spam mail detection ii) A Robot driving learning problem.	2.5 * 2 = 5	CO1	BTL-2
Or				
4)	Specify the learning task for 'A checkers learning problem' Discuss the following with respect to the above (i) Choosing the training experience. (ii) Choosing the target function and (iii) Choosing a function approximation algorithm	3+3+4 = 10	CO1	BTL-2

Part C

5a) Write the FIND S algorithm.

2

CO1

BTL-2

5b) Consider the given training example for Malignant tumors from MRI scans. Malignant is +ve and Benign is -ve

Find

- 1) How many concepts are possible for this instance space?
2. How many hypotheses can be expressed by the hypothesis language?
3. Apply the FIND-S algorithm to find Maximally Specific hypothesis. Consider the examples in the specified order and write down hypothesis each time after observing an example.

8

CO1

BTL-2

Example	Shape	Size	Color	Surface	Thickness	Target concept
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thick	Malignant
5	Circular	Small	Light	Smooth	Thick	Benign

Part D

6) For the "Japanese Economy Car" concept and instance given in Table, develop a Python program for FIND S algorithm with a display output of every instance and then display the Maximal Specific Hypothesis.

10

CO1

BTL 2

Write the output for the pgm for the table below.

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sports	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chrysler	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive

Part E

7) Discuss the issues (disadvantages) with the FIND S algorithm.

10

CO1

BTL-2

OR

8) What is Concept Learning and Explain the hypothesis Space of Find-S

10

CO1

BTL-2



CITY
ENGINEERING COLLEGE

Off Kanakapura Road, Doddakallasandra,
Bengaluru, 560062

SCHEME & SOLUTION OF VALUATION
INTERNAL TEST 1

SEMESTER VI

SECTION A

SUBJECT CODE : 18AI61

DATE OF TEST : 3rd May 2023

SUBJECT TITLE : Machine Learning

Ques. No	Details of the Answer	Marks Distribution	Total Marks
1a)	A well-posed learning problem has a defined training dataset, a clear prediction task, and measurable evaluation metrics. For example, image classification with labeled images (cats, dogs, birds) aims to train a model to accurately classify unseen images using metrics like accuracy, precision, recall, and F1-score.	5m (2.5 x 2)	5
1b)	Designing a learning system involves multiple stages: 1. Problem Definition: Clearly define the problem, task, input data, desired output, and constraints. 2. Data Collection and Preparation: Gather relevant data, clean, preprocess, and split it into training, validation, and test sets. 3. Feature Engineering: Select or create meaningful features that capture relevant information from the data. 4. Model Selection and Training: Choose a suitable machine learning algorithm or model architecture, train it on the training set, and optimize hyperparameters.	5m (0.5 x 10)	5

[Handwritten mark]

[Handwritten Signature]
HOD
Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off) Kanakapura Road,
Bangalore-560061



Off Kanakapura Road, Doddakallasandra,
Bengaluru, 560062

	<p>5. Model Evaluation: Assess the trained model's performance using appropriate evaluation metrics on the validation set or through cross-validation.</p> <p>6. Model Optimization: Fine-tune the model by adjusting hyperparameters, applying regularization techniques, or exploring different algorithms.</p> <p>7. Testing and Deployment: Evaluate the final model's performance on the test set to ensure unbiased evaluation. Deploy the model in a production environment.</p> <p>8. Monitoring and Maintenance: Continuously monitor the model's performance, collect feedback, and make necessary updates or retraining as needed.</p> <p>9. Documentation: Document the entire design process, including data collection, preprocessing, model selection, and evaluation, to ensure reproducibility and facilitate future enhancements.</p> <p>10. Iterative Improvement: Iterate through the design stages, incorporating feedback and new data, to continually improve the learning system's performance and adapt to evolving needs.</p>		
2a)	<p>Machine learning is used for its ability to identify complex patterns, automate tasks, adapt to new data, make predictions, personalize experiences, optimize processes, handle high-dimensional data, and more.</p> <p>The types of ML systems include supervised learning (labeled data for predictions), unsupervised learning (extracting patterns from unlabeled data), semi-supervised learning (combining labeled and unlabeled data), reinforcement learning (trial and error with rewards/punishments), deep learning (using deep neural networks for complex tasks), transfer learning (applying knowledge from one task to another), online learning (real-time updates with new data), and others.</p> <p>These ML systems cater to diverse problem domains, allowing for a wide range of applications and advancements in various industries.</p>	(5m) 2 3	5



2b)	<p>Machine learning faces several challenges:</p> <ol style="list-style-type: none">1. Data Quality: Obtaining high-quality, relevant, and representative data can be challenging, as it directly impacts the performance and generalization of ML models.2. Data Quantity: Sufficient amounts of labeled data are often required for training accurate and robust models, which can be expensive and time-consuming to collect or may not be readily available.3. Feature Engineering: Extracting meaningful features from raw data can be complex and domain-dependent, requiring domain expertise and manual effort.4. Overfitting and Underfitting: Balancing model complexity to avoid overfitting (capturing noise) or underfitting (lack of capturing underlying patterns) is a common challenge in ML.5. Algorithm Selection: Choosing the appropriate ML algorithm or model architecture for a specific problem requires knowledge and understanding of different algorithms and their applicability.6. Interpretability and Explainability: Complex ML models, such as deep neural networks, can be difficult to interpret, making it challenging to explain their decisions or actions.7. Scalability and Efficiency: Scaling ML models to handle large datasets and real-time applications can pose computational challenges, requiring efficient algorithms and hardware resources.8. Ethical and Bias Issues: ML models can be prone to biases and ethical concerns, such as discriminatory or unfair outcomes, which need careful consideration and mitigation.9. Transfer Learning and Generalization: Transferring knowledge from one task or domain to another and ensuring models generalize well to unseen data or new contexts can be challenging.	5m (0.5x10)	5m
-----	--	----------------	----



3a)	<p>10. Model Maintenance and Adaptation: ML models require regular monitoring, updating, and retraining to remain effective and adapt to changing environments or data distributions.</p> <p>Features of an unbiased learner:</p> <ol style="list-style-type: none">1. Objectivity: An unbiased learner makes predictions solely based on available data, without external influences or biases.2. Fairness: It avoids favoritism or discrimination towards any specific group, ensuring equal treatment and opportunities for all.3. Generalization: An unbiased learner aims to make unbiased predictions on new and unseen data, without being influenced by specific instances in the training data.4. Transparency: It provides interpretability, allowing users to understand the reasoning behind its predictions or decisions.5. Balanced Representation: An unbiased learner ensures adequate representation of all relevant groups, avoiding under or over-representation that can lead to biased outcomes.6. Bias Mitigation: It actively identifies and mitigates biases in the training data or algorithms, striving to minimize unfair or discriminatory patterns.7. Robustness: An unbiased learner is resilient to various biases, including algorithmic, dataset, and societal biases, maintaining fairness across different scenarios.8. Continuous Improvement: It learns from feedback, adapting its algorithms and processes to address biases and ensure fairness.9. Ethical Considerations: An unbiased learner adheres to ethical guidelines, aligning its predictions and classifications with ethical standards.	5m (0.5 x 10)	5M
-----	--	------------------	----



3b)	<p>10. Impact Assessment: It assesses the potential impact of its predictions, aiming to minimize negative consequences and disparities among different groups.</p> <p>i) Spam mail detection:</p> <p>Tasks: The task in spam mail detection is to accurately classify incoming emails as either spam or non-spam (ham). It involves analyzing the content, sender information, and other features of the email to make a prediction.</p> <p>Performance: The performance of a spam mail detection system is measured by metrics such as accuracy, precision, recall, and F1-score. High accuracy and low false positive and false negative rates are desired to minimize the misclassification of legitimate emails as spam or vice versa.</p> <p>Experience: User experience is important in spam mail detection. A good system should have a low false positive rate to prevent genuine emails from being wrongly classified as spam, ensuring that important messages are not missed. It should also provide user-friendly interfaces for managing spam filters and allowing users to customize their preferences.</p> <p>ii) Robot driving learning problem:</p> <p>Tasks: The task in a robot driving learning problem is to train a robot or autonomous vehicle to navigate and make driving decisions in various environments. It involves learning how to perceive the surroundings, recognize obstacles, interpret traffic signs, and make appropriate decisions like accelerating, braking, and steering.</p> <p>Performance: The performance of a robot driving system is measured by metrics such as accuracy, safety, and efficiency. The system should be able to accurately perceive and interpret the environment, make safe and timely driving decisions, and optimize the driving behavior to achieve efficient and smooth navigation.</p> <p>Experience: User experience is crucial in robot driving systems. The system should provide a comfortable and safe ride for</p>	5m (2.5 x 2)	5
-----	---	-----------------	---



passengers, ensuring smooth acceleration, braking, and steering. It should also be able to handle unexpected situations, such as sudden obstacles or adverse weather conditions, to maintain a reliable and enjoyable driving experience. Additionally, human interaction interfaces should be intuitive and informative, enabling clear communication between the robot and users when needed.

4)

i) Spam mail detection:

Tasks: The task in spam mail detection is to accurately classify incoming emails as either spam or non-spam (ham). It involves analyzing the content, sender information, and other features of the email to make a prediction.

Performance: The performance of a spam mail detection system is measured by metrics such as accuracy, precision, recall, and F1-score. High accuracy and low false positive and false negative rates are desired to minimize the misclassification of legitimate emails as spam or vice versa.

Experience: User experience is important in spam mail detection. A good system should have a low false positive rate to prevent genuine emails from being wrongly classified as spam, ensuring that important messages are not missed. It should also provide user-friendly interfaces for managing spam filters and allowing users to customize their preferences.

ii) Robot driving learning problem:

Tasks: The task in a robot driving learning problem is to train a robot or autonomous vehicle to navigate and make driving decisions in various environments. It involves learning how to perceive the surroundings, recognize obstacles, interpret traffic signs, and make appropriate decisions like accelerating, braking, and steering.

Performance: The performance of a robot driving system is measured by metrics such as accuracy, safety, and efficiency. The system should be able to accurately perceive and interpret the environment, make safe and timely driving decisions, and

10 m .



	<p>optimize the driving behavior to achieve efficient and smooth navigation.</p> <p>Experience: User experience is crucial in robot driving systems. The system should provide a comfortable and safe ride for passengers, ensuring smooth acceleration, braking, and steering. It should also be able to handle unexpected situations, such as sudden obstacles or adverse weather conditions, to maintain a reliable and enjoyable driving experience. Additionally, human interaction interfaces should be intuitive and informative, enabling clear communication between the robot and users when needed.</p>		
5a	<ol style="list-style-type: none">1. Initialize the most specific hypothesis h as the most specific hypothesis in the hypothesis space.2. For each positive training instance:<ul style="list-style-type: none">• For each attribute in the instance:<ul style="list-style-type: none">• If the attribute value is consistent with the current hypothesis h, do nothing.• If the attribute value is not consistent, replace the attribute value in h with a general value that does not rule out the positive instance.3. Output the final hypothesis h.	2	2
7	<ol style="list-style-type: none">1. Limited Expressiveness: The FIND-S algorithm can only represent the most specific hypothesis within the hypothesis space. It cannot handle complex hypotheses or capture the full range of possible patterns in the data.2. Lack of Negative Examples: The algorithm does not consider negative examples or instances that should not be classified as positive. It only focuses on finding a hypothesis that fits positive instances, potentially leading to poor generalization and misclassification of negative instances.3. Sensitivity to Noise and Outliers: The algorithm is sensitive to noisy or outlier data points. Since it focuses solely on positive instances, even a single mislabeled positive instance can lead to an incorrect hypothesis.		



4. Overfitting: FIND-S can easily overfit the training data if the hypothesis space is too expressive or if the data is noisy. It may result in a hypothesis that is too specific and does not generalize well to unseen instances.
5. Inefficiency in Large Hypothesis Spaces: In cases where the hypothesis space is large, the algorithm may require a significant amount of time and computational resources to iterate through all possible hypotheses, making it less efficient.
6. Dependency on Training Order: The order of the training instances can influence the final hypothesis obtained by the algorithm. Different training orderings may result in different hypotheses, potentially affecting the algorithm's reliability and consistency.

10

10

Concept learning refers to the process of acquiring knowledge or understanding about a concept or target function from examples or data. In machine learning, it involves learning a mapping between input instances and their corresponding output labels.

The hypothesis space of the FIND-S algorithm represents the set of all possible hypotheses that the algorithm considers during the learning process. In the context of FIND-S, the hypothesis space is defined by a set of conjunctions of attribute-value pairs.

For example, consider a binary classification problem of distinguishing between spam emails and non-spam (ham) emails. Each email instance is represented by a set of attributes (e.g., sender, subject, content), and the target output is the class label (spam or non-spam).

The hypothesis space of FIND-S would consist of all possible conjunctions of attribute-value pairs that can describe a hypothesis. Each attribute-value pair specifies a condition that an instance must satisfy to be classified as positive. The most specific hypothesis in the hypothesis space would be the conjunction of attribute-value pairs precisely capturing all positive instances that fits all positive instances while still being as specific as possible.

Vagdevi
HOD

ASSIGNMENT 1 : 18AI61

What is a well-posed learning problem? Explain with an example

Explain the various stages involved in designing a learning system

Discuss the issues (disadvantages) with the FIND S algorithm.

What is Machine Learning? Explain the applications of Machine Learning.

Why use Machine Learning? What are the types of Machine learning systems?

Discuss the four main challenges of machine learning

Find-S algorithm and show its working by taking the enjoy sport concept and training instances given in the below Table

Example	Sky	AirTemp	Humidity	Wind	Water	Forecast	Enjoy Sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

Discuss the features of an unbiased Learner.

State the following problems with respect to Tasks, Performance, and Experience:

- i) Spam mail detection ii) A Robot driving learning problem.

Specify the learning task for 'A checkers learning problem'.

Discuss the following with respect to the above,

- (i) Choosing the training experience.
- (ii) Choosing the target function and
- (iii) Choosing a function approximation algorithm.

Compulsory Questions:

Write the FIND S algorithm

Consider the given training example for Malignant tumors from MRI scans. Malignant is +ve and Benign is -ve

Find

- 1) How many concepts are possible for this instance space?
2. How many hypotheses can be expressed by the hypothesis language?
3. Apply the FIND-S algorithm to find Maximally Specific hypothesis. Consider the examples in the specified order and write down hypothesis each time after observing an example.

Example	Shape	Size	Color	Surface	Thickness	Target concept
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thick	Malignant
5	Circular	Small	Light	Smooth	Thick	Benign

For the "Japanese Economy Car" concept and instance given in Table, develop a Python program for FIND S algorithm with an output of every instance and then display the Maximal Specific Hypothesis.

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sports	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chrysler	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive



Vagdevi S
HOD

Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off) Kanakapura Road,
Bangalore-560061

18AI61 MACHINE LEARNING ASSIGNMENT -2

1. In context to prepare the data for Machine Learning algorithms, Write a note on (i) Data Cleaning (ii) Handling text and categorical attributes (iii) Feature scaling
2. Using code snippets, outline the concepts involved in i) Measuring accuracy using Cross-Validation. ii) Confusion Matrix. iii) Precision and Recall.
3. With the code snippet explain how Multi labels classification different from multi class Multi output classification?
4. Consider an example where the five weeks sales data (in thousands) is given as shown in table. Apply linear regression technique to predict the 7th and 12th week sales.

Xi (week)	Yi (sales in thousand)
1	1.2
2	1.8
3	2.6
4	3.2
5	3.8

5. Examine the following boosting methods along with code snippets. i) AdaBoost ii) Gradient Boosting.
6. Write a python program for Random Forest algorithm using the iris dataset.
7. Write a python program for Random Forest algorithm using the housing dataset.
8. Consider the "Japanese Economy Car" concept and Illustrate the hypothesis using Candidate Elimination Learning algorithm. Show the specific and general boundaries of the version space after applying candidate elimination algorithm.

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sport	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chrysler	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive

9. Consider the given below training example which finds malignant tumors from MRI scans.

Example	Shape	Size	Color	Surface	Thickness	Target concept
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thick	Malignant
5	Circular	Small	Light	Smooth	Thick	Benign

Show the specific and general boundaries of the version space after applying candidate elimination algorithm. (Note: malignant is +ve, Benign is -ve).

10. Consider the dataset shown below and illustrate the hypothesis using List Then Eliminate algorithm.

Size	Color	Shape	Class / Label
Big	Red	Circle	No
Small	Red	Triangle	No
Small	Red	Circle	Yes
Big	Blue	Circle	No
Small	Blue	Circle	Yes

11. Consider the "Enjoy Sport" concept and illustrate the hypothesis using List Then Eliminate algorithm.

Example	Sky	AirTemp	Humidity	Wind	Water	Forecast	EnjoySport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	high	Strong	Cool	Change	Yes

Vagdevi
HOD

Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off) Kanakapura Road,
Bangalore-560061

18AI61 - 3RD - ASSIGNMENT QUESTION

1. (a) what is gradient descent algorithm and discuss its various types. 10M
(b) In Regularized Linear Models illustrate the three different methods to constrain the Weights. 10M
2. (a) With respect to Nonlinear SVM Classification, explain Polynomial Kernel Gaussian and RBF Kernel along with code snippet. 10M
(b) Show that how SVMs make predictions using Quadratic Programming and Kernelized SVM. 10 M
3. (a) With an example dataset examine how Decision Trees are used in making predictions. 10M
(b) Explain The CART Training Algorithm. 06M
(c) Identify the features of Regression and Instability w.r.t decision trees. 04M
4. (a) In context to Ensemble methods determine the concepts of
i) Bagging and Pasting.
ii) Voting Classifiers. 10M
(b) Examine the following boosting methods along with code snippets.
i) AdaBoost
ii) Gradient Boosting 10M
5. (a) Write Bayes theorem. Identify the relationship between Bayes theorem and the problem of concept learning? 10M
(b) Show that how Maximum Likelihood Hypothesis is helpful for predicting probabilities. 10M
6. (a) Construct Naïve Bayes Classifier with an Example. 10M
(b) Derive the EM Algorithm in detail. 10M

Nagdev S
HOD
Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallappa, (Off) Kanakapura Road,
Bangalore-560061

ATTENDANCE

Contact hrs per week 3:2:0

Sl. No.	Reg. No.	Name
	1CE20AI	
1	001	ABDUL FAHEEM
2		
3	002	HAJIRA AHMED
4		
5	003	KEDAR JOSHI
6		
7	004	KOKILA .K.R.
8		
9	005	RITHIK MARIAN S
10		
11	006	SITARON .Z. SEBASTIAN
12		
13	007	SITARONA SAM
14		
15	008	SUHAS GAJANANA
16		
17	009	SYED ALIYAH BAKSHI
18		
19		
20		
21		
22		
23		
24		
25		
No. of Absents		
Initials		

IA1: 3/5, 4/5, 5/5
IA2: 8/6, 9/6, 10/6

7	13	13	14	15	15	20	21	22
6	6	6	6	6	6	6	6	6
42	43	44	45	46	47	48	49	50
A	37	38	39	40	41	42	43	44
33	34	35	36	37	38	39	40	41
34	35	36	37	38	39	40	41	42
42	43	44	45	46	47	48	49	50
← A B S E N T →								
36	37	38	A	39	40	41	42	43
35	36	37	38	39	40	41	42	43
34	35	36	37	38	39	40	41	42
38	39	40	41	42	43	44	45	46

B B B B B B B B B B

ASSESSMENT

22	23	26	27	28	28	30	% Attn.	TEST	Test	Mark	ADG	TEST	10	Sessional Marks	Signature of Student	
6	6	6	6	6	6	6		50	50	50	50	15				40
52	53	54	55	56	57	58	59	60	90	43	42				Fahim	
46	47	48	49	50	51	52	53									
43	44	45	46	47	48	49	50		85	42	50				Hajira Ahmed	
44	45	46	47	48	49	50	51		87	48	45					
52	53	54	55	56	57	58	59		100	48	50				Kokila.K.R.	
←								0%	→							
45	46	47	48	49	50	51	52		89	45	40				Sham	
45	46	47	48	49	50	51	52		89	50	47				Shamam Sam	
44	45	46	47	48	49	50	51		87	50	50				Rishabh	
48	49	50	51	52	53	54	55		94	47	50				Aliyab	

B B B B B B B B B B

RECORD OF CLASS WORK

3:2:0

Date	Period	Topics Covered
24/3/23	3 (Mod:1)	Machine Learning Landscape.
27/3/23	3	ML - what, why and Types
11/4/23	3	Case studies and Applications.
11/4/23	4	cont'd Applications of ML
12/4/23	3	Challenges of ML, Concept Learning
13/4/23	3	Learning Problems, checker game (RT)
13/4/23	4	Designing Learning System.
18/4/23	3	Designing system - Problems.
18/4/23	4	Perspective and Learning issues.
19/4/23	3	Concept Learning - Find S also
20/4/23	3	Pbs on Find S also on different
20/4/23	4	data sets and model paper discussion
25/4/23	3	Version spaces.
25/4/23	4	List then eliminate algo & Pb.
26/4/23	3	Candidate elimination algo.
27/4/23	3	Pbs from VTU QP on diff. data sets.
27/4/23	4 (Mod 2)	End to End ML Project. Working with data
2/5/23	3	Big Picture, Get data, discover & Visual data
2/5/23	4	Prepare data & Fine tune model.
9/5/23	3	Classification MNIST, Binary classification
9/5/23	4	Performance measure, Multilabel & cla
10/5/23	3	Error analysis
11/5/23	3	Output classification.
11/5/23	4	Model paper and QP discussion.

Vagdevi S

Teacher's Signature

Vagdevi S

HOD'S Signature

Thurs: Period 3 & 4 IA1: 3/5, 4/5, IA2: 8/6, 9/6, 10/6
4/5

RECORD OF CLASS WORK IA3: 6/6, 7/6, 8/6

Date	Period	Topics Covered
16/5/23 (Mod:3)	3	Training models: Linear Regression
16/5/23	4	Gradient descent
17/5/23	3	Polynomial Regression
18/5/23	3	Exercise and model QP.
18/5/23	4	Learning curves
23/5/23	3	Regularised and
23/5/23	4	Logistic Regression.
24/5/23	3	SVM - linear & Nonlinear
25/5/23	3	Contd SVM - Non linear
25/5/23	4	SVM regression.
30/5/23	3	Pbs. on SVM & VTU QPs
30/5/23	4	Discussion on model paper (Mod 3)
31/5/23	3 Mod:4	Decision trees: Training
1/6/23	3	Visualisation of DT.
1/6/23	4	Prediction (DT), Estimating class.
6/6/23	3	CART algo Training &
6/6/23	4	Computational Complexity.
7/6/23	3	GINI Impurity, Entropy
13/6/23	3	Pbs. on best split
13/6/23	4	Hyper Parameters, Regression instabi-
14/6/23	3	Ensemble learning & Random forest
15/6/23	3	Voting classifiers, Bagging &
15/6/23	4	Boosting, Patches
20/6/23	3	Boosting and stacking.

Vogden's

Teacher's Signature

Vogden's

HOD'S Signature



CITY
ENGINEERING COLLEGE

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE
LEARNING**

CIRCULAR

Ref No: CEC/AIML/DAC/ACY 2022-2023/01

Date: 1-02-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 8-02-2023 at 11: 00 AM in HOD's office AIML Department.

Agenda:

- The committee discussed various strategies to increase student.
- Faculty to design project guidelines and assessment criteria.
- Exposure to Usage of Tools in Courses of the Semester.
- Internship and Project Opportunities for Students.
- Organize hackathons, project exhibitions.

Vagdees
HOD

CC TO

1. PRINCIPAL OFFICE-CEC

2. All Members



CITY
ENGINEERING COLLEGE

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE
LEARNING**

Department Advisory Committee Meeting

Date: 8/02/2023

Time: 11:00 AM

Venue: HOD's office

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Dr. S Vagdevi	HOD	Convenor, HOD	
2	Mr. Subhash Murugesan	Founder, Aero knotz Drones India Private Limited	Industry Expert	
3	Dr. Prakash S	Associate Professor, Department of ISE, RNSIT.	Member	
4	Dr. C Ramchandra	Associate professor	Member	
5	Mrs. Vindhya R	Assistant Professor	Member	

The Department Advisory Committee meeting was conducted in Department of AIML, on 16th February, 2023, at 11 AM.

Agenda of the Meeting:

- The committee discussed various strategies to increase student .
- Faculty to design project guidelines and assessment criteria.
- Exposure to Usage of Tools in Courses of the Semester.
- Internship and Project Opportunities for Students.
- Organize hackathons, project exhibitions.



CITY
ENGINEERING COLLEGE

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- The need for students to gain hands-on experience with industry-standard tools and software was discussed.
- Possible tools and software relevant to each course were identified.
- The committee discussed various strategies to increase student engagement, including the use of interactive learning platforms, gamification, and collaborative projects.


Dr. S Vagdevi

HOD



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 Even SEM

	May2023		June 2023		July 2023		Aug 2023		Sept 2023	
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON	1									
TUE	2						1			
WED	3						2			
THU	4		1				3			
FRI	5		2				4		1	Start of II sem Practical
SAT	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday	5	1st Saturday holiday	2	1st Saturday holiday
SUN	7		4		2		6		3	
MON	8		5	4th sem start 8th sem Practical	3		7		4	
TUE	9		6		4		8		5	
WED	10		7		5		9		6	
THU	11		8		6		10		7	
FRI	12		9		7		11		8	
SAT	13		10		8		12		9	II sem last working day
SUN	14		11		9		13		10	
MON	15		12		10	VI SEM LAST WORING day	14		11	Start of II sem Practical
TUE	16	8th sem theory exam	13		11	6 TH sem practical exam	15	Independence day	12	
WED	17		14		12		16		13	
THU	18	8th sem theory exam	15		13		17		14	
FRI	19		16		14		18		15	IV sem last working day
SAT	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday	19	3rd Saturday holiday	16	3rd Saturday holiday
SUN	21		18		16		20		17	
MON	22		19		17		21		18	Ganesha festival
TUE	23		20		18		22		19	Start of IV sem Practical
WED	24		21		19		23		20	
THU	25	II SEM START IV sem Internship	22		20		24		21	Start of II sem Theory exam
FRI	26		23		21		25		22	
SAT	27		24		22		26		23	
SUN	28		25		23		27		24	
MON	29		26		24	6 TH sem Theory exam	28		25	
TUE	30		27		25		29		26	
WED	31		28		26		30		27	
THU			29	Bakrid	27		31		28	Id Milad
FRI			30		28				29	
SAT					29	Moharam			30	
SUN					30				31	
MON					31				3/10	Start of IV sem Theory



CITY ENGINEERING COLLEGE

Department of AIML

COE- 2022-23 - 6th SEM

DAY	March 2023		April 2023		May 2023		June 2023		July 2023	
	Date		Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	May day				
TUE					2					
WED	1				3	6 th Sem – I CIE				
THU	2				4					
FRI	3				5		1			
SAT	4				6		2			
SUN	5		1	1st Saturday holiday	7	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday
MON	6		2		8		4		2	
TUE	7		3		9		5	6 th Sem – II CIE	3	
WED	8		4		10		6		4	
THU	9		5		11		7		5	
FRI	10		6		12	Good Friday	8		6	6 th Sem – III CIE
SAT	11		7		13		9	7		
SUN	12		8		14		10	8		
MON	13		9		15		11	9		
TUE	14		10		16		12		10	6 th Sem Last Working Day
WED	15		11		17	8 th sem theory exam	13		11	6 th sem practical exam
THU	16		12		18	IV sem Internship	14		12	
FRI	17		13		19	8 th sem theory exam	15		13	
SAT	18		14	Ambedkar Jayanthi	20		16		14	
SUN	19		15	3rd Saturday holiday	21	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday
MON	20	6 th Sem Starts	16		22		18		16	
TUE	21		17		23		19		17	
WED	22	Ugadi	18		24		20		18	
THU	23		19		25		21		19	
FRI	24		20		26		22		20	
SAT	25		21		27		23		21	
SUN	26		22	Ramzan	28		24		22	
MON	27	VI sem orientation	23		29		25		23	
TUE	28	Sports and	24		30		26		24	6 th sem Theory exam
WED	29	Cultural Events	25		31		27		25	
THU	30	Ethnic Day	26				28		26	
FRI	31		27				29	Bakrid	27	
SAT			28				30		28	
SUN			29						29	Moharam
MON			30						30	
									31	

Vegden's
HOD



Department of Artificial Intelligence and Machine Learning

Subject Allotment: EVEN SEMESTER

Academic Year-2022-23

SL. NO.	Name of the Faculty	Course code and name	Year /semester	Signature
1	Dr. S Vagdevi	18AI61-Machine Learning 18AIL66-Machine Learning Lab 18AIL68-Mobile Application Development Lab.	3 rd /6 th 3 rd /6 th 3 rd /6 th	<i>Vagdevi</i>
2	Dr. C Ramachandra	18AI62-Digital Image processing	3 rd /6 th	<i>Dr. C Ramachandra</i>
3	Mr. Nandish A C	21UH49-Universal Human Values	2 nd /4 th	
4	Mrs. Vindhya	18AI644-Foundation for Data Science. 18AIL66-Machine Learning Lab 21CS482-R Programming	3 rd /6 th 3 rd /6 th 2 nd /4 th	<i>Vindhya</i>
5	Mr. Shivashankara N	18AI63-Java for Mobile Applications. 18AIL67-Digital Image processing Lab.	3 rd /6 th	<i>Shivashankara</i>
6	Mrs. Soumya	18AIL67-Digital Image processing Lab 21CS44-Operating Systems. 21CS482-R Programming	3 rd /6 th 2 nd /4 th 2 nd /4 th	<i>Soumya</i>
7	Mrs. Salika Fathima	21CS42-Design and Analysis of Algorithm. 21CSL46-Python Programming Laboratory. 18AIL68-Mobile Application Development Lab.	2 nd /4 th 2 nd /4 th 3 rd /6 th	<i>Salika</i>
8	Mr. Suhas	21CS43-Microcontroller and Embedded Systems. 21CS482-R Programming	2 nd /4 th 2 nd /4 th	<i>Suhas</i>
9	Ms. Arshiya Fathima	BPOPS203-Principles of Programming using C	1 st /2 nd	<i>Arshiya</i>

Vagdevi

Dr. S Vagdevi

HOD

Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off) Kanakapura Road,
Bangalore-560061



CITY ENGINEERING COLLEGE

Department of AI & ML

IV SEM

Time Table for EVEN SEM AY 2022-2023

W.E.F.05/06/2023

Room:304

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 AM	12:15 – 01:15PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM	
MON	PYTHON(A1) / MES(A2) LAB		Short Break	CIP	MATHS	Lunch Break	R TUTORIALS			
TUE	DAA	MATHS		OS	UHV		PYTHON (T)	AE LAB A1		
WED	DAA(A1)/ PYTHON (A2) LAB			DAA	MES		OS	MATHS		
THU	MATHS	OS		BIO	PYTHON(T)		MES	AE LAB A2		
FRI	OS	BIO		MES	DAA		MES (A1)/ DAA(A2) LAB			
SAT	MAT DIP			INTERNSHIP PRESENTATION						

Sl. No	Course Code	Course Name	Course	Faculty Name
1	21CS41	Mathematical foundations for computing	MATHS	Ms. Vanitha
2	21CS42	Design and Analysis of Algorithm	DAA	Mrs Salika Fathima
3	21CS43	Microcontroller and Embedded Systems	MES	Mr. SUHAS
4	21CS44	Operating Systems	OS	Mrs. Soumya
5	21BE45	Biology for engineers	BIO	
6	21CSL46	Python programming laboratory	PYTHON	Mrs Vindhya/ Mr. Shivshankar/ Mrs. Salika Fathima
7	21CIP47	Constitution of India and professional ethics	CIP	
8	21CS482	Ability Enhancement Course (R Programming)		Mrs Vindhya R/ Mr. SUHAS /Mrs Soumya
9	21UH49	Universal Human Values	UHV	Mr. Nandish A C
10	21MATDIP41	Additional Math's-I	MATDIP	Mrs. Rekha/ Mrs. Vanitha
11		DAA LAB		Mr. Salika Fathima / Mrs. Soumya
12		MES LAB		MR. SUHAS S

Class Teacher:

HOD
 Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
 Doddanahalli (KT) Kanakapura Road,
 Bangalore-560061

Principal
CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061



CITY ENGINEERING COLLEGE

Department of AI & ML

VI SEM

Time Table for EVEN SEM AY 2022-2023

W.E.F: 20/03/2023

Room:403

DAY	09:00- 10:00 AM	10:00 - 11:00 AM	11:15- 12:15 AM	12:15 - 01:15PM	02:00 - 03:00 PM	03:00 - 04:00 PM	04:00 - 05:00 PM
MON	18ME651 NCE	18AI644 FDS	18AIL66(T) ML LAB(T)	18AIL68(T) MAD (T)	18AIL67(T) DIP LAB(T)	18AI63 JMA	
TUE	18AIL67(L) DIP LAB		18AI61 ML		18AI62 DIP	18AI63 JMA	18AIL67(T) DIP LAB (T)
WED	18AI62 DIP	18ME651 NCE	18AI61 ML	18AI62 DIP	18AIL68(T) MAD LAB(T)	18AIL68 MAD LAB	
THU	18AI63 SN	18ME651 NCE	18AI61 ML		18AI644 FDS	18AIL66(T) ML LAB(T)	18AI63(T) JMA
FRI	18AI62(T) DIP (T)	18AI644 FDS	18AIL66 ML LAB		18AI62(T) DIP(T)	18AI63(T) JMA	
SAT	18AIL68	18AI644	(MINI PROJECT)		MINI PROJECT		

Sl. No	Course Code	Course Name	Course	Faculty Name
1	18AI61	MACHINE LEARNING	ML	Dr S Vagdevi
2	18AI62	DIGITAL IMAGE PROCESSING	DIP	Dr C Ramachandra
3	18AI63	JAVA FOR MOBILE APPLICATIONS	JMA	Shivashankara N
4	18AI644	FOUNDATIONS FOR DATA SCIENCE	FDS	Mrs Vindhya R
5	18ME651	NON-CONVENTIONAL ENERGY	NCE	Mr Harshavardhan
6	18AIL66	MACHINE LEARNING LAB	ML LAB	Dr S Vagdevi/Mrs Vindhya R
7	18AIL67	DIGITAL IMAGE PROCESSING LAB	DIP LAB	Dr C Ramachandra /Mr Shivashankara N/Soumya
8	18AIL68	MOBILE APPLICATION DEVELOPMENT LAB	MAD LAB	Dr S Vagdevi /Mr Shivashankara N/Salika Fathima

Class Teacher:

HOD
Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (C) Hanakapura Road,
Bangalore-560061

Skandan

Principal
PRINCIPAL
CITY ENGINEERING COLLEGE
Hanakapura Main Road, BANGALORE - 560 061

COURSE FILE

AY 2022-2023 EVEN SEMESTER

Name: Dr. S Vagdevi

Designation: HOD AIML Department

Subject: 18AI61

Subject Name : Machine Learning



CITY ENGINEERING COLLEGE

Department of AI & ML

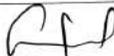
INDIVIDUAL TIME

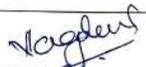
Time Table for EVEN SEM AY 2022-2023

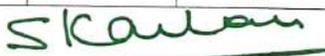
Faculty: Dr S Vagdevi

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15 – 12:15 AM	12:15 – 01:15PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM	
MON			Short Break	PLC		Lunch Break	18AIMP68(T)	18AI61(T)		
TUE					PLC			PLC LAB A1 BATCH		
WED				18AI61 ML	18AI61(T)			18AIMP68(T)	18AIMP68 MAD LAB	
THU				18AI61 ML	18AI61 ML			18AIL66 (T) ML LAB		
FRI				18AIL66 ML LAB						
SAT										

Sl. No	Course Code	Course Name	THEORY	TUTORIALS	PRACTICALS	UNITS
1	18AI61	MACHINE LEARNING	3	2		5
2	18AIL66	MACHINE LEARNING LAB		2	2	3
3	18AMP68	MOBILE APPLICATION DEVELOPMENT LAB		2	2	3
4	BPLCK205B	INTRODUCTION TO PYTHON PROGRAMMING	2			2
5	18AMP68	MAD MINI PROJECT (3 BATCHES)				3
					TOTAL	16


Class Teacher:


HOD
Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off: Kanakapura Road,
Bangalore-560061


Principal
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Artificial Intelligence and Machine Learning (AI)
 Scheme of Teaching and Examinations
 Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
 (Effective from the academic year 2018 - 19)

VI SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination			Credits		
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks		Total Marks	
					L	T	P						
1	PCC	18AI61	Machine Learning	CS / IS / AI	3	2	--	03	40	60	100	4	
2	PCC	18AI62	Digital Image Processing	CS / IS / AI	3	2	--	03	40	60	100	4	
3	PCC	18AI63	Java for Mobile Applications	CS / IS / AI	3	2	--	03	40	60	100	4	
4	PEC	18AI64X	Professional Elective -I	CS / IS / AI	3	--	--	03	40	60	100	3	
5	OEC	18AI65X	Open Elective -A	CS / IS / AI	3	--	--	03	40	60	100	3	
6	PCC	18AIL66	Machine Learning Laboratory	CS / IS / AI	--	2	2	03	40	60	100	2	
7	PCC	18AIL67	Digital Image Processing Laboratory with mini project	CS / IS / Ai	--	2	2	03	40	60	100	2	
8	MP	18AIL68	Mobile Application Development Laboratory	CS / IS / AI	--	2	2	03	40	60	100	2	
9	INT	--	Internship	(To be carried out during the intervening vacations of VI and VII semesters)				--	--	--	--	--	--
TOTAL					15	12	6	24	320	480	800	24	

Note: PCC: Professional core, PEC: Professional Elective, OE: Open Elective, MP: Mini-project, INT: Internship.

Professional Elective - I	
Course code under 18XX64X	Course Title
18AI641	Natural Language Processing
18AI642	Software Project and Management
18AI643	Web Programming
18AI644	Foundation for Data Science
Open Elective -A (18CS65x are not to be opted by CSE / ISE /AIML Programs)	
18CS651	Mobile Application Development
18CS652	Introduction to Data Structures and Algorithms
18CS653	Programming in JAVA
18CS654	Introduction to Operating System

Students can select any one of the open electives offered by any Department (Please refer to the list of open electives under 18CS65X). Selection of an open elective is not allowed provided,

- The candidate has studied the same course during the previous semesters of the programme.
- The syllabus content of open elective is similar to that of Departmental core courses or professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.

Registration to electives shall be documented under the guidance of Programme Coordinator/ Adviser/Mentor.

Mini-project work: Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini- project can be assigned to an individual student or to a group having not more than 4 students.

CIE procedure for Mini project:

(i) **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the Mini-project work, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

(ii) **Interdisciplinary:** Continuous Internal Evaluation shall be group wise at the college level with the participation of all the guides of the college. The CIE marks awarded for the Mini-project, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

SEE for Mini project:

(i) **Single discipline:** Contribution to the Mini-project and the performance of each group member shall be assessed individually in the semester end examination (SEE) conducted at the department.

(ii) **Interdisciplinary:** Contribution to the Mini-project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted separately at the departments to which the student/s belong to.

Internship: All the students admitted to III year of BE/B. Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not takeup/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

MACHINE LEARNING
(Effective from the academic year 2018 -2019)
SEMESTER – VI

Subject Code	18AI61	CIE Marks	40
Number of Contact Hours/Week	3:2:0	SEE Marks	60
Total Number of Contact Hours	50	Exam Hours	3 Hrs

CREDITS – 04

Course Learning Objectives: This course will enable students to:

- Define machine learning and understand the basic theory underlying machine learning.
- Differentiate supervised, unsupervised and reinforcement learning
- Understand the basic concepts of learning and decision trees.
- Understand Bayesian techniques for problems appear in machine learning
- Perform statistical analysis of machine learning techniques.

Module – 1

Introduction:

Machine learning Landscape: what is ML?, Why, Types of ML, main challenges of ML (T2:Chapter1)
Concept learning and Learning Problems – Designing Learning systems, Perspectives and Issues –
Concept Learning – Find S-Version Spaces and Candidate Elimination Algorithm –Remarks on VS-
Inductive bias –

T2: Chapter 1

T1: Chapter 1 and 2)

CH

10

Module – 2

End to end Machine learning Project :

Working with real data, Look at the big picture, Get the data, Discover and visualize the data,
Prepare the data, select and train the model, Fine tune your model
Classification : MNIST, training a Binary classifier, performance measure, multiclass
classification, error analysis, multi label classification, multi output classification
(T2: Chapter 2 and 3)

10

Module – 3

Training Models: Linear regression, gradient descent, polynomial regression, learning curves,
regularized linear models, logistic regression
Support Vector Machine: linear, Nonlinear , SVM regression and under the hood
(T2: Chapter 4 and 5)

RBT: L1, L2

10

Module – 4

Decision Trees

Training and Visualizing DT, making prediction, estimating class, the CART training,
computational complexity, GINI impurity, Entropy, regularization Hyper parameters, Regression,
instability

Ensemble learning and Random Forest:

Voting classifiers, Bagging and pasting, Random patches, Random forests, Boosting, stacking

(T2: Chapter 6 and 7)

RBT: L1, L2

10

Module – 5

Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length
Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier– example-
Bayesian Belief Network – EM Algorithm

Text book (T1: Chapter 6)

RBT: L1, L2

10

Course outcomes: The students should be able to:

- Choose the learning techniques with this basic knowledge.
- Apply effectively ML algorithms for appropriate applications.
- Apply bayesian techniques and derive effectively learning rules.

Question Paper Pattern:

- The question paper will have ten questions.
- Each full Question consisting of 20 marks
- There will be 2 full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer 5 full questions, selecting one full question from each module.

Textbooks:

1. Tom M. Mitchell, Machine Learning, McGraw-Hill Education, 2013
2. AurelienGeron, Hands-on Machine Learning with Scikit-Learn &TensorFlow , O'Reilly, Shroff Publishers and Distributors pvt.Ltd 2019

Reference Books:

1. EthemAlpaydin, Introduction to Machine Learning, PHI Learning Pvt. Ltd, 2nd Ed., 2013
2. T. Hastie, R. Tibshirani, J. H. Friedman, The Elements of Statistical Learning, Springer, 1st edition, 2001
3. Machine Learning using Python ,Manaranjan Pradhan, U Dinesh kumar, Wiley, 2019
4. Machine Learning, SaikatDutt, Subramanian Chandramouli, Amit Kumar Das, Pearson,2020

LESSON PLAN

Contact hours per week 3:2:0

Week	Date		Topics Planned
	From	To	
I	20/3/23	31/3/23 mod 1	Machine learning landscape: what is ML? why? Types of ML. Case studies and applications.
II	3/4/23	8/4/23	Main challenges of ML. Concept learning and learning pbs. Designing learning systems. 3 pbs.
III	10/4/23	15/4/23	Perspective and learning issues: Concept learning - Find S Algo. and pbs on diff. data sets.
IV	17/4/23	22/4/23	Version spaces, list then eliminate algo and candidate elimination ^{VTU's} algo. Pbs. on diff. data sets from
V	24/4/23	29/4/23 mod 2	End to End ML project: Working with real data, look at the Big Picture, Get the data, Discover data
VI	1/5/23	6/5/23	Visualise data, Prepare the data Select and train the model, Fine tune your model. IA1 - 3/5, 4/5, 5/5.
VII	8/5/23	13/5/23	classification: MNIST, Using a binary classifier, Performance measure, multiclass & Multilabel, error analysis and output classificat
VIII	15/5/23	20/5/23 Module 3	Training models: Linear, regression, Gradient descent, polynomial reg. learning curves regularised and logistic regression.

Start date: 20/3/2023 End date: 10/7/2023.

LESSON PLAN

28/3/23 to 31/3/23
college day activities

Week	Date		Topics Planned
	From	To	
IX	22/5/23	27/5/23	SVM, linear and non linear, ^{VTU} SVM regression. Pbs on models, regression and on using data sets.
X	29/5/23	3/6/23 ^{mod 4 ✓}	Decision trees: Training and visualisation DT, prediction, estimate class, CART training, computational complexity.
XI	5/6/23	10/6/23	GINI impurity, Entropy, regularization hyper parameters, Regression instability. IA2: 8/6, 9/6, 10/6.
XII	12/6/23	17/6/23	Ensemble learning and Random forest: Voting classifiers, Bagging and boosting, patches, Boosting, stacking
XIII	19/6/23	24/6/23 ^{mod 5 ✓}	Bayes Theorem: concept learning - Maximum likelihood - Minimum Description length Principle & associated QP Pbs.
XIV	26/6/23	1/7/23	Bayes optimal classifier, Gibbs algorithm, Naive Bayes classifier, example. Bayesian Belief NW, EM algorithm.
XV	3/7/23	8/7/23	IA-3
XVI	10/7/23		IA marks Finalisation & Signatures.

Vagdevi S
.....
Teacher's Signature

Vagdevi S
.....
HOD'S Signature

USN 1 C E 2 0 A 1 0 0

COURSE CODE : 18AI61

CITY ENGINEERING COLLEGE
Kanakapura Road, Doddakallasandra, Bengaluru - 560062
FIRST INTERNAL TEST

Programme: Artificial Intelligence & Machine Learning
 Course Name: MACHINE LEARNING
 Sem: 6
 Duration: 1 ½ Hrs

Date: 03/05/2023
 Time: 10:30AM – 12:00 Noon

MAX MARKS: 50

Note: 1) PART C AND PART D ARE COMPULSORY
 2) Answer any ONE full question from PART A, B & E

		Marks	CO 1	BTL
Part A				
1a)	What is a well-posed learning problem? Explain with an example.	2+3 =5	CO1	BTL 2
1b)	Explain the various stages involved in designing a learning system	5	CO1	BTL 2
Or				
2a)	Why use Machine Learning? What are the types of Machine learning systems?	2+3 =5	CO1	BTL-2
2b)	Discuss the main challenges of machine learning	5	CO1	BTL-2
Part B				
3a)	Discuss the features of an unbiased Learner	5	CO1	BTL-2
3b)	State the following problems with respect to Tasks, Performance, and Experience: i) Spam mail detection ii) A Robot driving learning problem.	2.5 * 2 = 5	CO1	BTL-2
Or				
4)	Specify the learning task for 'A checkers learning problem' Discuss the following with respect to the above (i) Choosing the training experience. (ii) Choosing the target function and (iii) Choosing a function approximation algorithm	3+3+4 = 10	CO1	BTL-2

Part C

5a) Write the FIND S algorithm.

2

CO1

BTL-2

5b) Consider the given training example for Malignant tumors from MRI scans. Malignant is +ve and Benign is -ve

Find

- 1) How many concepts are possible for this instance space?
2. How many hypotheses can be expressed by the hypothesis language?
3. Apply the FIND-S algorithm to find Maximally Specific hypothesis. Consider the examples in the specified order and write down hypothesis each time after observing an example.

8

CO1

BTL-2

Example	Shape	Size	Color	Surface	Thickness	Target concept
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thick	Malignant
5	Circular	Small	Light	Smooth	Thick	Benign

Part D

6) For the "Japanese Economy Car" concept and instance given in Table, develop a Python program for FIND S algorithm with a display output of every instance and then display the Maximal Specific Hypothesis.

10

CO1

BTL 2

Write the output for the pgm for the table below.

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sports	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chrysler	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive

Part E

7) Discuss the issues (disadvantages) with the FIND S algorithm.

10

CO1

BTL-2

OR

8) What is Concept Learning and Explain the hypothesis Space of Find-S

10

CO1

BTL-2



CITY
ENGINEERING COLLEGE

Off Kanakapura Road, Doddakallasandra,
Bengaluru, 560062

SCHEME & SOLUTION OF VALUATION
INTERNAL TEST 1

SEMESTER VI

SECTION A

SUBJECT CODE : 18AI61

DATE OF TEST : 3rd May 2023

SUBJECT TITLE : Machine Learning

Ques. No	Details of the Answer	Marks Distribution	Total Marks
1a)	A well-posed learning problem has a defined training dataset, a clear prediction task, and measurable evaluation metrics. For example, image classification with labeled images (cats, dogs, birds) aims to train a model to accurately classify unseen images using metrics like accuracy, precision, recall, and F1-score.	5m (2.5 x 2)	5
1b)	Designing a learning system involves multiple stages: 1. Problem Definition: Clearly define the problem, task, input data, desired output, and constraints. 2. Data Collection and Preparation: Gather relevant data, clean, preprocess, and split it into training, validation, and test sets. 3. Feature Engineering: Select or create meaningful features that capture relevant information from the data. 4. Model Selection and Training: Choose a suitable machine learning algorithm or model architecture, train it on the training set, and optimize hyperparameters.	5m (0.5 x 10)	5

[Handwritten mark]

[Handwritten Signature]
HOD
Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off) Kanakapura Road,
Bangalore-560061



Off Kanakapura Road, Doddakallasandra,
Bengaluru, 560062

	<p>5. Model Evaluation: Assess the trained model's performance using appropriate evaluation metrics on the validation set or through cross-validation.</p> <p>6. Model Optimization: Fine-tune the model by adjusting hyperparameters, applying regularization techniques, or exploring different algorithms.</p> <p>7. Testing and Deployment: Evaluate the final model's performance on the test set to ensure unbiased evaluation. Deploy the model in a production environment.</p> <p>8. Monitoring and Maintenance: Continuously monitor the model's performance, collect feedback, and make necessary updates or retraining as needed.</p> <p>9. Documentation: Document the entire design process, including data collection, preprocessing, model selection, and evaluation, to ensure reproducibility and facilitate future enhancements.</p> <p>10. Iterative Improvement: Iterate through the design stages, incorporating feedback and new data, to continually improve the learning system's performance and adapt to evolving needs.</p>		
2a)	<p>Machine learning is used for its ability to identify complex patterns, automate tasks, adapt to new data, make predictions, personalize experiences, optimize processes, handle high-dimensional data, and more.</p> <p>The types of ML systems include supervised learning (labeled data for predictions), unsupervised learning (extracting patterns from unlabeled data), semi-supervised learning (combining labeled and unlabeled data), reinforcement learning (trial and error with rewards/punishments), deep learning (using deep neural networks for complex tasks), transfer learning (applying knowledge from one task to another), online learning (real-time updates with new data), and others.</p> <p>These ML systems cater to diverse problem domains, allowing for a wide range of applications and advancements in various industries.</p>	(5m) 2 3	5



2b)	<p>Machine learning faces several challenges:</p> <ol style="list-style-type: none">1. Data Quality: Obtaining high-quality, relevant, and representative data can be challenging, as it directly impacts the performance and generalization of ML models.2. Data Quantity: Sufficient amounts of labeled data are often required for training accurate and robust models, which can be expensive and time-consuming to collect or may not be readily available.3. Feature Engineering: Extracting meaningful features from raw data can be complex and domain-dependent, requiring domain expertise and manual effort.4. Overfitting and Underfitting: Balancing model complexity to avoid overfitting (capturing noise) or underfitting (lack of capturing underlying patterns) is a common challenge in ML.5. Algorithm Selection: Choosing the appropriate ML algorithm or model architecture for a specific problem requires knowledge and understanding of different algorithms and their applicability.6. Interpretability and Explainability: Complex ML models, such as deep neural networks, can be difficult to interpret, making it challenging to explain their decisions or actions.7. Scalability and Efficiency: Scaling ML models to handle large datasets and real-time applications can pose computational challenges, requiring efficient algorithms and hardware resources.8. Ethical and Bias Issues: ML models can be prone to biases and ethical concerns, such as discriminatory or unfair outcomes, which need careful consideration and mitigation.9. Transfer Learning and Generalization: Transferring knowledge from one task or domain to another and ensuring models generalize well to unseen data or new contexts can be challenging.	5m (0.5x10)	5m
-----	--	----------------	----



3a)	<p>10. Model Maintenance and Adaptation: ML models require regular monitoring, updating, and retraining to remain effective and adapt to changing environments or data distributions.</p> <p>Features of an unbiased learner:</p> <ol style="list-style-type: none">1. Objectivity: An unbiased learner makes predictions solely based on available data, without external influences or biases.2. Fairness: It avoids favoritism or discrimination towards any specific group, ensuring equal treatment and opportunities for all.3. Generalization: An unbiased learner aims to make unbiased predictions on new and unseen data, without being influenced by specific instances in the training data.4. Transparency: It provides interpretability, allowing users to understand the reasoning behind its predictions or decisions.5. Balanced Representation: An unbiased learner ensures adequate representation of all relevant groups, avoiding under or over-representation that can lead to biased outcomes.6. Bias Mitigation: It actively identifies and mitigates biases in the training data or algorithms, striving to minimize unfair or discriminatory patterns.7. Robustness: An unbiased learner is resilient to various biases, including algorithmic, dataset, and societal biases, maintaining fairness across different scenarios.8. Continuous Improvement: It learns from feedback, adapting its algorithms and processes to address biases and ensure fairness.9. Ethical Considerations: An unbiased learner adheres to ethical guidelines, aligning its predictions and classifications with ethical standards.	5m (0.5 x 10)	5M
-----	--	------------------	----



<p>3b)</p>	<p>10. Impact Assessment: It assesses the potential impact of its predictions, aiming to minimize negative consequences and disparities among different groups.</p> <p>i) Spam mail detection:</p> <p>Tasks: The task in spam mail detection is to accurately classify incoming emails as either spam or non-spam (ham). It involves analyzing the content, sender information, and other features of the email to make a prediction.</p> <p>Performance: The performance of a spam mail detection system is measured by metrics such as accuracy, precision, recall, and F1-score. High accuracy and low false positive and false negative rates are desired to minimize the misclassification of legitimate emails as spam or vice versa.</p> <p>Experience: User experience is important in spam mail detection. A good system should have a low false positive rate to prevent genuine emails from being wrongly classified as spam, ensuring that important messages are not missed. It should also provide user-friendly interfaces for managing spam filters and allowing users to customize their preferences.</p> <p>ii) Robot driving learning problem:</p> <p>Tasks: The task in a robot driving learning problem is to train a robot or autonomous vehicle to navigate and make driving decisions in various environments. It involves learning how to perceive the surroundings, recognize obstacles, interpret traffic signs, and make appropriate decisions like accelerating, braking, and steering.</p> <p>Performance: The performance of a robot driving system is measured by metrics such as accuracy, safety, and efficiency. The system should be able to accurately perceive and interpret the environment, make safe and timely driving decisions, and optimize the driving behavior to achieve efficient and smooth navigation.</p> <p>Experience: User experience is crucial in robot driving systems. The system should provide a comfortable and safe ride for</p>	<p>5m (2.5 x 2)</p>	<p>5</p>
------------	---	-------------------------	----------



passengers, ensuring smooth acceleration, braking, and steering. It should also be able to handle unexpected situations, such as sudden obstacles or adverse weather conditions, to maintain a reliable and enjoyable driving experience. Additionally, human interaction interfaces should be intuitive and informative, enabling clear communication between the robot and users when needed.

4)

i) Spam mail detection:

Tasks: The task in spam mail detection is to accurately classify incoming emails as either spam or non-spam (ham). It involves analyzing the content, sender information, and other features of the email to make a prediction.

Performance: The performance of a spam mail detection system is measured by metrics such as accuracy, precision, recall, and F1-score. High accuracy and low false positive and false negative rates are desired to minimize the misclassification of legitimate emails as spam or vice versa.

Experience: User experience is important in spam mail detection. A good system should have a low false positive rate to prevent genuine emails from being wrongly classified as spam, ensuring that important messages are not missed. It should also provide user-friendly interfaces for managing spam filters and allowing users to customize their preferences.

ii) Robot driving learning problem:

Tasks: The task in a robot driving learning problem is to train a robot or autonomous vehicle to navigate and make driving decisions in various environments. It involves learning how to perceive the surroundings, recognize obstacles, interpret traffic signs, and make appropriate decisions like accelerating, braking, and steering.

Performance: The performance of a robot driving system is measured by metrics such as accuracy, safety, and efficiency. The system should be able to accurately perceive and interpret the environment, make safe and timely driving decisions, and

10 m .



Off Kanakapura Road, Doddakallasandra,
Bengaluru, 560062

	<p>optimize the driving behavior to achieve efficient and smooth navigation.</p> <p>Experience: User experience is crucial in robot driving systems. The system should provide a comfortable and safe ride for passengers, ensuring smooth acceleration, braking, and steering. It should also be able to handle unexpected situations, such as sudden obstacles or adverse weather conditions, to maintain a reliable and enjoyable driving experience. Additionally, human interaction interfaces should be intuitive and informative, enabling clear communication between the robot and users when needed.</p>		
5a	<ol style="list-style-type: none">1. Initialize the most specific hypothesis h as the most specific hypothesis in the hypothesis space.2. For each positive training instance:<ul style="list-style-type: none">• For each attribute in the instance:<ul style="list-style-type: none">• If the attribute value is consistent with the current hypothesis h, do nothing.• If the attribute value is not consistent, replace the attribute value in h with a general value that does not rule out the positive instance.3. Output the final hypothesis h.	2	2
7	<ol style="list-style-type: none">1. Limited Expressiveness: The FIND-S algorithm can only represent the most specific hypothesis within the hypothesis space. It cannot handle complex hypotheses or capture the full range of possible patterns in the data.2. Lack of Negative Examples: The algorithm does not consider negative examples or instances that should not be classified as positive. It only focuses on finding a hypothesis that fits positive instances, potentially leading to poor generalization and misclassification of negative instances.3. Sensitivity to Noise and Outliers: The algorithm is sensitive to noisy or outlier data points. Since it focuses solely on positive instances, even a single mislabeled positive instance can lead to an incorrect hypothesis.		



4. Overfitting: FIND-S can easily overfit the training data if the hypothesis space is too expressive or if the data is noisy. It may result in a hypothesis that is too specific and does not generalize well to unseen instances.
5. Inefficiency in Large Hypothesis Spaces: In cases where the hypothesis space is large, the algorithm may require a significant amount of time and computational resources to iterate through all possible hypotheses, making it less efficient.
6. Dependency on Training Order: The order of the training instances can influence the final hypothesis obtained by the algorithm. Different training orderings may result in different hypotheses, potentially affecting the algorithm's reliability and consistency.

10

10

Concept learning refers to the process of acquiring knowledge or understanding about a concept or target function from examples or data. In machine learning, it involves learning a mapping between input instances and their corresponding output labels.

The hypothesis space of the FIND-S algorithm represents the set of all possible hypotheses that the algorithm considers during the learning process. In the context of FIND-S, the hypothesis space is defined by a set of conjunctions of attribute-value pairs.

For example, consider a binary classification problem of distinguishing between spam emails and non-spam (ham) emails. Each email instance is represented by a set of attributes (e.g., sender, subject, content), and the target output is the class label (spam or non-spam).

The hypothesis space of FIND-S would consist of all possible conjunctions of attribute-value pairs that can describe a hypothesis. Each attribute-value pair specifies a condition that an instance must satisfy to be classified as positive. The most specific hypothesis in the hypothesis space would be the conjunction of attribute-value pairs precisely capturing all positive instances that fits all positive instances while still being as specific as possible.

Vagdekar
HOD

ASSIGNMENT 1 : 18AI61

What is a well-posed learning problem? Explain with an example

Explain the various stages involved in designing a learning system

Discuss the issues (disadvantages) with the FIND S algorithm.

What is Machine Learning? Explain the applications of Machine Learning.

Why use Machine Learning? What are the types of Machine learning systems?

Discuss the four main challenges of machine learning

Find-S algorithm and show its working by taking the enjoy sport concept and training instances given in the below Table

Example	Sky	AirTemp	Humidity	Wind	Water	Forecast	Enjoy Sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

Discuss the features of an unbiased Learner.

State the following problems with respect to Tasks, Performance, and Experience:

- i) Spam mail detection ii) A Robot driving learning problem.

Specify the learning task for 'A checkers learning problem'.

Discuss the following with respect to the above,

- (i) Choosing the training experience.
- (ii) Choosing the target function and
- (iii) Choosing a function approximation algorithm.

Compulsory Questions:

Write the FIND S algorithm

Consider the given training example for Malignant tumors from MRI scans. Malignant is +ve and Benign is -ve

Find

- 1) How many concepts are possible for this instance space?
2. How many hypotheses can be expressed by the hypothesis language?
3. Apply the FIND-S algorithm to find Maximally Specific hypothesis. Consider the examples in the specified order and write down hypothesis each time after observing an example.

Example	Shape	Size	Color	Surface	Thickness	Target concept
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thick	Malignant
5	Circular	Small	Light	Smooth	Thick	Benign

For the "Japanese Economy Car" concept and instance given in Table, develop a Python program for FIND S algorithm with an output of every instance and then display the Maximal Specific Hypothesis.

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sports	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chrysler	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive



Vagdevi S
HOD
Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off) Kanakapura Road,
Bangalore-560061

18AI61 MACHINE LEARNING ASSIGNMENT -2

1. In context to prepare the data for Machine Learning algorithms, Write a note on (i) Data Cleaning (ii) Handling text and categorical attributes (iii) Feature scaling
2. Using code snippets, outline the concepts involved in i) Measuring accuracy using Cross-Validation. ii) Confusion Matrix. iii) Precision and Recall.
3. With the code snippet explain how Multi labels classification different from multi class Multi output classification?
4. Consider an example where the five weeks sales data (in thousands) is given as shown in table. Apply linear regression technique to predict the 7th and 12th week sales.

Xi (week)	Yi (sales in thousand)
1	1.2
2	1.8
3	2.6
4	3.2
5	3.8

5. Examine the following boosting methods along with code snippets. i) AdaBoost ii) Gradient Boosting.
6. Write a python program for Random Forest algorithm using the iris dataset.
7. Write a python program for Random Forest algorithm using the housing dataset.
8. Consider the "Japanese Economy Car" concept and Illustrate the hypothesis using Candidate Elimination Learning algorithm. Show the specific and general boundaries of the version space after applying candidate elimination algorithm.

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sport	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chrysler	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive

9. Consider the given below training example which finds malignant tumors from MRI scans.

Example	Shape	Size	Color	Surface	Thickness	Target concept
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thick	Malignant
5	Circular	Small	Light	Smooth	Thick	Benign

Show the specific and general boundaries of the version space after applying candidate elimination algorithm. (Note: malignant is +ve, Benign is -ve).

10. Consider the dataset shown below and illustrate the hypothesis using List Then Eliminate algorithm.

Size	Color	Shape	Class / Label
Big	Red	Circle	No
Small	Red	Triangle	No
Small	Red	Circle	Yes
Big	Blue	Circle	No
Small	Blue	Circle	Yes

11. Consider the "Enjoy Sport" concept and illustrate the hypothesis using List Then Eliminate algorithm.

Example	Sky	AirTemp	Humidity	Wind	Water	Forecast	EnjoySport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	high	Strong	Cool	Change	Yes

Vagdevi
HOD

Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallasandra, (Off) Kanakapura Road,
Bangalore-560061

18AI61 - 3RD - ASSIGNMENT QUESTION

1. (a) what is gradient descent algorithm and discuss its various types. 10M
(b) In Regularized Linear Models illustrate the three different methods to constrain the Weights. 10M
2. (a) With respect to Nonlinear SVM Classification, explain Polynomial Kernel Gaussian and RBF Kernel along with code snippet. 10M
(b) Show that how SVMs make predictions using Quadratic Programming and Kernelized SVM. 10 M
3. (a) With an example dataset examine how Decision Trees are used in making predictions. 10M
(b) Explain The CART Training Algorithm. 06M
(c) Identify the features of Regression and Instability w.r.t decision trees. 04M
4. (a) In context to Ensemble methods determine the concepts of
i) Bagging and Pasting.
ii) Voting Classifiers. 10M
(b) Examine the following boosting methods along with code snippets.
i) AdaBoost
ii) Gradient Boosting 10M
5. (a) Write Bayes theorem. Identify the relationship between Bayes theorem and the problem of concept learning? 10M
(b) Show that how Maximum Likelihood Hypothesis is helpful for predicting probabilities. 10M
6. (a) Construct Naïve Bayes Classifier with an Example. 10M
(b) Derive the EM Algorithm in detail. 10M

Nagdev S
HOD
Dept of Artificial Intelligence & Machine Learning
CITY ENGINEERING COLLEGE
Doddakallappa, (Off) Kanakapura Road,
Bangalore-560061

RECORD OF CLASS WORK

3:2:0

Date	Period	Topics Covered
24/3/23	3 (Mod:1)	Machine Learning Landscape.
27/3/23	3	ML - what, why and Types
11/4/23	3	Case studies and Applications.
11/4/23	4	cont'd Applications of ML
12/4/23	3	Challenges of ML, Concept Learning
13/4/23	3	Learning Problems, checker game (RT)
13/4/23	4	Designing Learning System.
18/4/23	3	Designing system - Problems.
18/4/23	4	Perspective and Learning issues.
19/4/23	3	Concept Learning - Find S also
20/4/23	3	Pbs on Find S also on different
20/4/23	4	data sets and model paper discussion
25/4/23	3	Version spaces.
25/4/23	4	List then eliminate algo & Pb.
26/4/23	3	Candidate elimination algo.
27/4/23	3	Pbs from VTU QP on diff. data sets.
27/4/23	4 (Mod 2)	End to End ML Project. Working with data
2/5/23	3	Big Picture, Get data, discover & Visual data
2/5/23	4	Prepare data & Fine tune model.
9/5/23	3	Classification MNIST, Binary classification
9/5/23	4	Performance measure, Multilabel & cla
10/5/23	3	Error analysis
11/5/23	3	Output classification.
11/5/23	4	Model paper and QP discussion.

Vagdevi S

Teacher's Signature

Vagdevi S

HOD'S Signature

Thurs: Period 3 & 4 IA1: 3/5, 4/5, IA2: 8/6, 9/6, 10/6
4/5

RECORD OF CLASS WORK IA3: 6/6, 7/6, 8/6

Date	Period	Topics Covered
16/5/23 (Mod:3)	3	Training models: Linear Regression
16/5/23	4	Gradient descent
17/5/23	3	Polynomial Regression
18/5/23	3	Exercise and model QP.
18/5/23	4	Learning curves
23/5/23	3	Regularised and
23/5/23	4	Logistic Regression.
24/5/23	3	SVM - linear & Nonlinear
25/5/23	3	Contd SVM - Non linear
25/5/23	4	SVM regression.
30/5/23	3	Pbs. on SVM & VTU QPs
30/5/23	4	Discussion on model paper (Mod 3)
31/5/23	3 Mod:4	Decision trees: Training
1/6/23	3	Visualisation of DT.
1/6/23	4	Prediction (DT), Estimating class.
6/6/23	3	CART algo Training &
6/6/23	4	Computational Complexity.
7/6/23	3	GINI Impurity, Entropy
13/6/23	3	Pbs. on best split
13/6/23	4	Hyper Parameters, Regression instabi-
14/6/23	3	Ensemble learning & Random forest
15/6/23	3	Voting classifiers, Bagging &
15/6/23	4	Boosting, Patches
20/6/23	3	Boosting and stacking.

Vogden's

Teacher's Signature

Vogden's

HOD'S Signature



CITY
ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE
ACADEMIC YEAR 22-23 EVEN SEMESTER
CIRCULAR

Ref No: CEC/BS/DAC/ACY 2022-23/OR/01

Date: 15-05-2022

This is to inform the members of Department Advisory Committee that meeting is scheduled on 17-05-2022 at 10: 00 AM in Physics Laboratory.

Agenda:

- Commencement of classes for 2nd semester students
- Phase II Student Induction Programme for 2nd semester students
- Conduction of Talents Day
- Organizing Battle of Science- Project Exhibition
- Organizing value added courses/ circular courses in the curriculum
- Organizing FDP


HOD

Department of Physics

HEAD OF THE DEPT. OF PHYSICS
CITY ENGINEERING COLLEGE,
Doddakallasandra, Kanakapura Main Road,
BANGALORE - 560 082.



CITY
ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE

Department Advisory Committee Meeting

Date: 17-05-2022

Time: 10:00 AM

Venue: Physics Laboratory

List of DAC Members

Sl. No	Member Name	Designation	Role	Signature
1	Dr. Rajasekhar. P	HOD & Professor	Convenor	
2	Dr. K Sujatha	HOD & Professor	Member	
3	Dr. Jyothi. P	HOD & Professor	Member	
4	Mrs. Nagasree G	Assistant Professor	Member	
5	Dr. Sunitha. N	Associate Professor	Member	
6	Mrs. Vanitha. G R	Assistant Professor	Member	
7	Mr. Rekha. R	Assistant Professor	Member	
8	Mrs. Anitha. C. V	Assistant Professor	Member	
9	Ms. Janavi. R	Assistant Professor	Member	
10	Mr. Arjun	Assistant Professor	Member	
11	Mr. Sadashiva. R	Assistant Professor	Member	
12	Mr. Dinesh S	Assistant Professor	Member	
13.	Mr. Sudish Kumar. N	TCS, Manager.	Member	

Agenda of the Meeting:

- Commencement of classes for 2nd semester students
- Phase II Student Induction Programme for 2nd semester students
- Conduction of Talents day
- Organizing Battle of Science- Project Exhibition
- Organizing value added courses/ certificate courses in the curriculum
- Organizing FDP

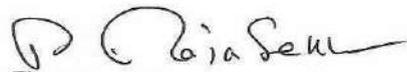


CITY
ENGINEERING COLLEGE

Minutes of Meeting:

The members discussed suggestions for improvement and reviewed the meeting agenda.

- Battle of Science is a project exhibition focuses on displaying interests and diverse projects.
- Discussed about a location with enough space for display of projects and ECE laboratory are chosen for exhibition.
- Setting up a registration process for participants.
- Providing certificates to all participants and cash prize for winners.
- Value added course on public speaking skills to be organized.


Convenor

Dr. Rajasekhar. P

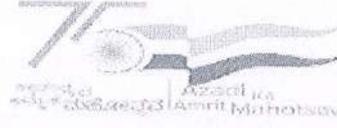
Dr P. RAJASEKHAR,
M.Sc; M.Phil, Ph.D
HEAD OF THE DEPT. OF CHEMISTRY
CITY ENGINEERING COLLEGE,
Doddakallasandra, Kanakapura Main Road
BANGALORE - 560 062.
Ph (O) 26669313 (M) 92428 92734



HOD

Department of Physics

HEAD OF THE DEPT. OF PHYSICS
CITY ENGINEERING COLLEGE,
Doddakallasandra, Kanakapura Main Road,
BANGALORE - 560 062.



ವಿಶ್ವೇಶ್ವರಯ್ಯತಾಂತ್ರಿಕವಿಶ್ವವಿದ್ಯಾಲಯ

ವಿಟಿಯುಲಢಿನಿಯಮಂ ೯೯೪ ರಲಡಿಲಲ್ಲಿಕರ್ನಾಟಕಸರ್ಕಾರದಿಂದಸ್ಥಾಪಿತವಾದರಾಜ್ಯವಿಶ್ವವಿದ್ಯಾಲಯ

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

State University of Government of Karnataka Established as per the VTU Act, 1994 "JnanaSangama" Belagavi-590018, Karnataka, India

Prof. B. E. Rangaswamy, Ph.D
REGISTRAR

Phone: (0831) 2498100
Fax: (0831) 2405467

REF: VTU/BGM/GC/2023/ 712

DATE: 9 MAY 2023

Revised-NOTIFICATION

Subject: Tentative Academic Calendar of II Semester B.E./B.Tech., B.Arch and B.Plan and IV semester B.E./B.Tech., programs of University regarding...

Reference: Hon'ble Vice-Chancellor's approval dated: 9 MAY 2023

The computer-Aided Engineering Drawing (BCEDK103) examinations of II semester B.E./B.Tech., programs are scheduled between 15.05.2023 to 24.05.2023. A revised Academic Calendar (Tentative) of II Semester B.E./B.Tech., B.Arch and B.Plan and IV semester B.E./B.Tech., programs of the University for the academic year 2022-23 are hereby notified as mentioned below;

(Tentative) Academic Calendar for semesters of II semester B.E./B.Tech./B.Arch./B.Plan and IV semester B.E./B.Tech., Programs for AY 2022-23 (May 2023)			
	II Semester B.E./B.Tech. (2022 scheme)	II Semester B. Arch, B. Plan (2021 scheme)	IV Semester B.E./ B.Tech (2021 scheme)
Commencement of the semester	25.05.2023	17.05.2023	17.05.2023
Internship	-----	-----	17.05.2023 To 03.06.2023
Commencement of the Classes	25.05.2023	17.05.2023	05.06.2023
Last Working day of the Semester	09.09.2023	31.08.2023	16.09.2023
Practical Examination/Viva Examination	11.09.2023 To 20.09.2023	01.09.2023 To 08.09.2023	19.09.2023 To 30.09.2023
Theory Examinations	21.09.2023 To 21.10.2023	11.09.2023 To 27.09.2023	03.10.2023 To 20.10.2023
Commencement of next Semester	25.10.2023	09.10.2023	25.10.2023

R

Please Note:

- The academic sessions for EVEN semesters should commence on the **date mentioned** above. The **induction program** shall be conducted for 10 days for 2nd-semester students. Scheduling the induction program's activities during the afternoon session in the 1st week is advised, the remaining sessions of induction programs shall be planned on Saturdays. The colleges must email a brief report to **sbhalbhavi@vtu.ac.in** after completing the Induction program
- The college may hold extra classes on Saturdays and Sundays to complete academic activities within the specified timeframe.
- The faculty/staff shall be available to undertake any work assigned by the university.
- University Examination Calendars will be published by the Registrar (Evaluation) from time to time.
- The Academic Calendar may be modified as MHRD/UGC/AICTE/state governments issue guidelines/directives in the future.
- Academic calendars are also applicable to autonomous colleges. If any changes are to be made by Autonomous colleges in the academic terms and examination schedule, they could do so with the approval of the university
- If any clarification/correction/suggestions, please email **sbhalbhavi@vtu.ac.in**

The principals of engineering colleges under the ambit of the University, are hereby informed to bring the academic calendar to the notice of all concerned. The Chairpersons of the PG department of the University where UG programs are offered are hereby informed to bring the academic calendar to the notice of the all concerned

The Directors of Schools of Architecture and Planning under the ambit of the university are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The principal of all engineering colleges, Directors of Schools of Architecture and Planning, under the ambit of VTU Belagavi. The Chairperson of the PG Department of the university.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director I/c. ITI SMU, VTU Belagavi for information and to make arrangements to upload Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director of Central Placement Officer VTU Belagavi for information
7. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

Rao B.E
09/05/23
REGISTRAR
A.



CITY ENGINEERING COLLEGE, BENGALURU-560061.
DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES ACADEMIC CALENDAR 2022-23 (EVEN SEM)

MAY 2023		JUNE 2023		JULY 2023		AUG 2023		SEPT 2023		
DAY	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT
MON	1									
TUE	2									
WED	3						1			
THU	4		1				2			
FRI	5		2				3			
SAT	6	1ST SATURDAY HOLIDAY	3	1ST SATURDAY HOLIDAY	1	1ST SATURDAY HOLIDAY	4	1ST SATURDAY HOLIDAY	1	START OF II SEM PRACTICAL
SUN	7		4		2		5	1ST SATURDAY HOLIDAY	2	1ST SATURDAY HOLIDAY
MON	8		5	4TH SEM START 8TH SEM PRACTICAL	3		6		3	
TUE	9		6		4	6 TH SEM III IA, 2ND SEM IIA	7	2ND SEM II IA	4	2ND SEM III IA
WED	10		7		5		8		5	
THU	11		8		6		9		6	
FRI	12		9	6 TH SEM II IA	7		10		7	MOM ON CURRICULUM
SAT	13		10		8		11		8	MOM ON CURRICULUM ENRICHMENT
SUN	14		11		9		12		9	2 SEM LAST WORKING DAY
MON	15		12		10	VI SEM LAST WORKING DAY	13		10	
TUE	16	8TH SEM THEORY EXAM	13		11	6TH SEM PRACTICAL EXAM	14		11	START OF II SEM PRACTICAL EXAM, 4 TH SEM III IA, INAUGURATION DAY - 1ST SEM AND ORIENTATION DAY
WED	17		14		12		15	INDEPENDENCE DAY	12	
THU	18	8TH SEM THEORY EXAM	15		13		16		13	
FRI	19		16		14	SPORTS DAY	17	BATTLE OF SCIENCE	14	IV SEM LAST WORKING-DAY
SAT	20	3RD SATURDAY HOLIDAY	17	3RD SATURDAY HOLIDAY	15	3RD SATURDAY HOLIDAY	18	3RD SATURDAY HOLIDAY	15	3RD SATURDAY HOLIDAY
SUN	21		18		16		19		16	
MON	22		19		17		20		17	
TUE	23	MOM ON CURRICULUM	20		18	4 TH SEM I IA	21	4 TH SEM II IA	18	GANESHA FESTIVAL
WED	24	MOM ON CURRICULUM ENRICHMENT	21		19		22		19	START OF IV SEM PRACTICAL
THU	25	2 SEM ORIENTATION IV SEM INTERNSHIP	22		20		23		20	TALENTS DAY
FRI	26		23		21		24		21	START OF II SEM THEORY EXAM
SAT	27		24		22		25		22	
SUN	28		25		23		26		23	
MON	29		26		24	6TH SEM THEORY EXAM	27		24	
TUE	30	START OF 2 ND SEM	27		25		28		25	
WED	31		28		26		29		26	
THU			29	BAKRID	27		30		27	
FRI			30		28		31		28	ID MILAD
SAT					29	MOHARAM			29	
SUN					30				30	
MON					31				31	START OF IV SEM THEORY


 PRINCIPAL
CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23

DEPARTMENT OF APPLIED SCIENCE & HUMANITIES
COURSE PREFERENCE

Name of the Faculty: Dr. Sujatha K

Designation: Professor and HOD

Sl. No	Course Code and Name	Year/Semester
1.	BPHYS202 Applied Physics for EEE Scheme For D sections	2022/II

Signature of Faculty

Department of Physics

HOD

Department of Physics



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23

DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

COURSE PREFERENCE

Name of the Faculty: Mrs. Nagasree G

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	BPHS202 Applied Physics for Computer Science & Engineering Scheme For E, F section	2022/II

Signature of Faculty

Department of Physics

HOD

Department of Physics



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23

DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

COURSE PREFERENCE

Name of the Faculty: Mr. Dinesh S

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	BPHYSL202, BPHYEL202 Applied Physics for Computer Science & Engineering Scheme and EEE Scheme - Laboratory	2022/II

A handwritten signature in black ink, appearing to be 'Dinesh S'.

Signature of Faculty

Department of Physics

A handwritten signature in black ink, appearing to be 'KS'.

HOD

Department of Physics



**TIME TABLE –SECOND SEMESTER MAY 2023
PHYSICS CYCLE**

SECTION: D

BRANCH: CS

ROOM NO: 007

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON	ESC	ETC	BREAK	MATS	PHYS	LUNCH	←---PHYL/POPL/MATL /D1/D2/D3---→			
TUE	POP	←PHYL/		POPL /MATL /D2/D3/D1→						
WED	MATS	PHYS		IDT			ESC	←---PHYL/POPL/MATL /D3/D1/D2---→		
THU	PHYS	MATS		ETC			POP			
FRI	ETC	KSK		MATS(T)			KAN(KBK)	DEPT/COLLEGE ACTIVITIES		
SAT	ESC	PHYS(T)		ENG			Proctor Meeting D1/D2/D3	LIBRARY		

SUBJECT CODE	SUBJECT NAME	NO. OF HOURS	FACULTY NAME
BMATS201	Mathematics for CSE Stream	4	Anitha.C.V
BPHYS202	Physics for CSE Stream	4	Dr. K. Sujatha
BPOPS203	Principles of Programming using C	2	Shruthi B.S
BESCK204D	Introduction to Mechanical Engineering	3	Mathenullah Shariff
BETCK205H	Introduction to Internet of Things	3	Tara
BPWSK206	Professional Writing Skills in English	1	Arjun
BKSKK207/BKKBK207	Samskruthika Kannada/ Balake Kannada	1	Deepa.G
BIDTK258	Innovation & Design Thinking	1	Vinay
MATL	Mat Lab	3x3	Anitha / Janavi
PHYL	Physics Lab	3x3	Dr. K. Sujatha / Nagashree. G
POPL	C-Programming Lab	3x3	Arshiya

HOD
Dr. K. Sujatha

PRINCIPAL
Dr. Tippetwamy H N



TIMETABLE –SECOND SEMESTER – MAY 2023
PHYSICS CYCLE

SECTION: E

BRANCH: CS

ROOM NO: A006

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	ETC	MATS	BREAK	POP	PHYS	LUNCH			
TUE	MATS	ETC		ESC	KSK		←-PHYL/ POPL/MATL /E1/E2/E3-→		
WED	ESC	←PHYL/		POPL /MATL /E2/E3/E1→					
THU	MATS	POP		PHYS	ETC		←- PHYL/POPL/MATL/E3/E1/E2-→		
FRI	PHYS	ESC		MATS(T)	KAN(KBK)		DEPT/COLLEGE ACTIVITIES		
SAT	ENG	PHYS(T)		IDT	Proctor Meeting E1/E2/E3		LIBRARY		

SUBJECT CODE	SUBJECT NAME	NO OF HOURS	FACULTY NAME
BMATS201	Mathematics for CSE Stream	4	Dr.Jyothi.P
BPHYS202	Physics for CSE Stream	4	Nagashree.G
BPOPS203	Principles of Programming using C	2	Shruthi Vijay
BESCK204D	Introduction to Mechanical Engineering	3	Dr. S. Karunakara
BETCK205H	Introduction to Internet of Things	3	Tara
BPWSK206	Professional Writing Skills in English	1	Arjun
BKSKK207/BKKBK207	Samskruthika Kannada/ Balake Kannada	1	Deepa.G
BIDTK258	Innovation & Design Thinking	1	Vinay
MATL	Mat Lab	3x3	Anitha / Janavi
PHYL	Physics Lab	3x3	Dr. K Sujatha / Nagashree.G
POPL	C-Programming Lab	3x3	Arshiya

HOD
Dr. K. Sujatha

PRINCIPAL
Dr. Tippeswamy H N



**TIMETABLE –SECOND SEMESTER – MAY 2023
PHYSICS CYCLE**

SECTION: F

BRANCH: CS

ROOM NO: A005

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON	POP	← PHYL/	BREAK	CPL /MATL/F1/F2/F3→		LUNCH				
TUE	MATS	PHYS		ENG	POP		ESC	KSK		
WED	ESC	ETC		MATS	PHYS		DEPT/COLLEGE ACTIVITIES			
THU	PHYS	← PHYL/		CPL /MATL/F2/F3/F1→						
FRI	ETC	MATS		PHYS	KAN(KBK)		←-PHYL/ CPL/MATL/F3/F1/ F2-→			
SAT	ETC	MATS		ESC	IDT		PROCTOR MEETING F1/F2/F3/LIBRARY			

SUBJECT CODE	SUBJECT NAME	NO OF HOURS	FACULTY NAME
BMATS201	Mathematics for CSE Stream	4	Vanitha G
BPHYS202	Physics for CSE Stream	4	Nagashree. G
BPOPS203	Principles of Programming using C	2	Arshiya
BESCK204B	Introduction to Mechanical Engineering	3	Anil Kumar
BETCK205H	Introduction to Internet of Things	3	Shruthi.B.S
BPWSK206	Professional Writing Skills in English	1	Arjun
BKSKK207/BKKBK207	Samskruthika Kannada/ Balake Kannada	1	Deepa.G
BIDTK258	Innovation & Design Thinking	1	Vinay
MATL	Mat Lab	3x3	Anitha / Janavi
PHYL	Physics Lab	3x3	Dr. K Sujatha / Nagashree. G
POPL	C-Programming Lab	3x3	Arshiya

HOD
Dr. K. Sujatha

PRINCIPAL
Dr. Tippeswamy H N



TIME TABLE –SECOND SEMESTER MAY 2023
PHYSICS CYCLE

Dr. K. Sujatha

Subject Code: BPHYE202

BRANCH: CS

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON			BREAK		D	LUNCH	←-----PHYL/D1-----→			
TUE		←PHYL/D2		PHYL /D2-----→						
WED		D		←-----PHYL/E2-----→			←-----PHYL/D3-----→			
THU	D	←PHYL/F2		PHYL/F2-----→						
FRI										
SAT		D(T)					Proctor Meeting D1/D2/D3			

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakepura Main Road, BANGALORE - 560 061

PRINCIPAL



CITY
ENGINEERING COLLEGE

TIMETABLE –SECOND SEMESTER – MAY 2023
PHYSICS CYCLE

Mrs. Nagashree.G

Subject Code: BPHYE202

BRANCH: CS

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON		←PHYL/F1	BREAK	PHYLF1→	E	LUNCH				
TUE		F						←-----PHYL/E1-----→		
WED							F			
THU	F				E			←-----PHYL/E3-----→		
FRI	E				F(T)			←-----PHYL/F3-----→		
SAT		E(T)					Proctor Meeting E1/E2/E3			

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

PRINCIPAL



TIMETABLE –FIRST SEMESTER – DECEMBER – 2022-23
PHYSICS CYCLE

Mr. Dinesh S

Subject Code: BPHYE202

BRANCH: CS

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON		←PHYL F1	BREAK	PHYL F1-----→		LUNCH	←-----PHYL/D1-----→		
TUE		←PHYL D2		PHYL D2-----→			←-----PHYL/ E1-----→		
WED		←PHYL/E2		PHYL/E2-----→			←-----PHYL/D3-----→		
THU		←PHYL F2		PHYL F2-----→			←----- PHYL/E3-----→		
FRI							←-----PHYL/F3-----→		
SAT									

HOD
Dr. K. Sujatha

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 081

PRINCIPAL
Dr. Tippeswamy H N

Course Title:	Applied Physics for CSE Stream		
Course Code:	BPHYS102/202	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours Theory + 10-12 Lab slots	Credits	04
Course objectives			
<ul style="list-style-type: none"> · To study the essentials of photonics and its application in computer science. · To study the principles of quantum mechanics and its application in quantum computing. · To study the electrical properties of materials · To study the essentials of physics for computational aspects like design and data analysis. 			
Teaching-Learning Process			
These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective			
<ol style="list-style-type: none"> 1. Flipped Class 2. Chalk and Talk 3. Blended Mode of Teaching and Learning 4. Simulations, Interactive Simulations and Animations 5. NPTEL and Other Videos for theory topics 6. Smart Class Room 7. Lab Experiment Videos 			
Module-1 (8 Hours)			
Laser and Optical Fibers:			
LASER: Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Einstein's A and B Coefficients and Expression for Energy Density (Derivation), Laser Action, Population Inversion, Metastable State, Requisites of a laser system, Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling(Qualitative), Numerical Problems.			
Optical Fiber: Principle and Structure, Propagation of Light, Acceptance angle and Numerical Aperture (NA), Derivation of Expression for NA, Modes of Propagation, RI Profile, Classification of Optical Fibers, Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems			
Pre requisite: Properties of light			
Self-learning: Total Internal Reflection			
Module-2 (8 Hours)			
Quantum Mechanics:			
de Broglie Hypothesis and Matter Waves, de Broglie wavelength and derivation of expression by analogy, Phase Velocity and Group Velocity, Heisenberg's Uncertainty Principle and its application (Non existence of electron inside the nucleus - Non Relativistic), Principle of Complementarity, Wave Function, Time independent Schrödinger wave equation (Derivation), Physical Significance of a wave function and Born Interpretation, Expectation value, Eigen functions and Eigen Values, Particle inside one dimensional infinite potential well, Quantization of Energy States, Waveforms and Probabilities. Numerical Problems.			
Pre requisite: Wave-Particle dualism			
Self-learning: de Broglie Hypothesis			
Module-3 (8 Hours)			
Quantum Computing:			
Principles of Quantum Information & Quantum Computing:			
Introduction to Quantum Computing, Moore's law & its end, Differences between Classical & Quantum computing. Concept of qubit and its properties. Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits.			
Dirac representation and matrix operations:			
Matrix representation of 0 and 1 States, Identity Operator I, Applying I to $|0\rangle$ and $|1\rangle$ states, Pauli Matrices and its			

operations on $|0\rangle$ and $|1\rangle$ states, Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product), Probability, and Quantum Superposition, normalization rule. Orthogonality, Orthonormality. Numerical Problems

Quantum Gates:

Single Qubit Gates: Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate

Multiple Qubit Gates: Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of Swap gate, Controlled -Z gate, Toffoli gate.

Pre requisites: Matrices

Self-learning: Moore’s law

Module-4 (8 Hours)

Electrical Properties of Materials and Applications

Electrical Conductivity in metals

Resistivity and Mobility, Concept of Phonon, Matheissen’s rule, Failures of Classical Free Electron Theory, Assumptions of Quantum Free Electron Theory, Fermi Energy, Density of States, Fermi Factor, Variation of Fermi Factor With Temperature and Energy. Numerical Problems.

Superconductivity

Introduction to Super Conductors, Temperature dependence of resistivity, Meissner’s Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative), Quantum Tunnelling, High Temperature superconductivity, Josephson Junctions (Qualitative), DC and RF SQUIDS (Qualitative), Applications in Quantum Computing: Charge, Phase and Flux qubits, Numerical Problems.

Pre requisites: Basics of Electrical conductivity

Self-learning: Resistivity and Mobility

Module-5 (8 hours)

Applications of Physics in computing:

Physics of Animation:

Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale, Weight and Strength, Motion and Timing in Animations, Constant Force and Acceleration, The Odd rule, Odd-rule Scenarios, Motion Graphs, Examples of Character Animation: Jumping, Parts of Jump, Jump Magnification, Stop Time, Walking: Strides and Steps, Walk Timing. Numerical Problems

Statistical Physics for Computing: Descriptive statistics and inferential statistics, Poisson distribution and modeling the probability of proton decay, Normal Distributions (Bell Curves), Monte Carlo Method: Determination of Value of π . Numerical Problems.

Pre requisites: Motion in one dimension, Probability

Self-learning: Frames, Frames per Second

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

CO1	Describe the principles of LASERS and Optical fibers and their relevant applications.
CO2	Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.
CO3	Summarize the essential properties of superconductors and its applications in qubits.
CO4	Illustrate the application of physics in design and data analysis.
CO5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation(CIE):

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

CIE for the theory component of the IC

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15th week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

Semester End Examination(SEE):

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

Suggested Learning Resources:**Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)**

1. Solid State Physics, S O Pillai, New Age International Private Limited, 8th Edition, 2018.
2. Engineering Physics by Gupta and Gour, Dhanpat Rai Publications, 2016 (Reprint).
3. A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
4. Concepts of Modern Physics, Aurthur Beiser, McGrawhill, 6th Edition, 2009.
5. Lasers and Non Linear Optics, B B Loud, New age international, 2011 edition.
6. A Textbook of Engineering Physics by M.N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
7. Quantum Computation and Quantum Information, Michael A. Nielsen & Isaac L. Chuang, Cambridge Universities Press, 2010 Edition.

8. Quantum Computing, Vishal Sahani, McGraw Hill Education, 2007 Edition.
9. Quantum Computing – A Beginner’s Introduction, Parag K Lala, Indian Edition, Mc GrawHill, Reprint 2020.
10. Engineering Physics, S P Basavaraj, 2005 Edition, Subhash Stores.
11. Physics for Animators, Michele Bousquet with Alejandro Garcia, CRC Press, Taylor & Francis, 2016.
12. Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations, Maria Luisa Dalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli, Trends in Logic, Volume 48, Springer.
13. Statistical Physics: Berkely Physics Course, Volume 5, F. Reif, McGraw Hill.
14. Introduction to Superconductivity, Michael Tinkham, McGraw Hill, INC, II Edition

Web links and Video Lectures (e-Resources):

LASER: <https://www.youtube.com/watch?v=WgzynecPiyc>

Superconductivity : <https://www.youtube.com/watch?v=MT5Xl5ppn48>

Optical Fiber : https://www.youtube.com/watch?v=N_kA8EpCUQo

Quantum Mechanics : <https://www.youtube.com/watch?v=p7bzE1E5PMY&t=136s>

Quantum Computing : <https://www.youtube.com/watch?v=jHoEjvuPoB8>

Quantum Computing : <https://www.youtube.com/watch?v=ZuvCUU2jD30>

Physics of Animation : https://www.youtube.com/watch?v=kj1kaA_8Fu4

Statistical Physics Simulation : https://phet.colorado.edu/sims/html/plinko-probability/latest/plinko-probability_en.html

NPTEL Superconductivity: <https://archive.nptel.ac.in/courses/115/103/115103108/>

NPTEL Quantum Computing : <https://archive.nptel.ac.in/courses/115/101/115101092>

Virtual LAB : <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>

Virtual LAB : <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

<http://nptel.ac.in> <https://swayam.gov.in>

https://virtuallabs.merlot.org/vl_physics.html

<https://phet.colorado.edu>

<https://www.myphysicslab.com>

Laboratory Component:

Any Ten Experiments have to be completed from the list of experiments

Note: The experiments have to be classified into

- a) Exercise
- b) Demonstration
- c) Structured Inquiry
- d) Open Ended

Based on the convenience classify the following experiments into above categories. Select at least one simulation/spreadsheet activity.

List of Experiments

1. Determination of wavelength of LASER using Diffraction Grating.
2. Determination of acceptance angle and numerical aperture of the given Optical Fiber.
3. Determination of Magnetic Flux Density at any point along the axis of a circular coil.
4. Determination of resistivity of a semiconductor by Four Probe Method
5. Study the I-V Characteristics of the Given Bipolar Junction Transistor.
6. Determination of dielectric constant of the material of capacitor by Charging and Discharging method.
7. Study the Characteristics of a Photo-Diode and to determine the power responsivity / Verification of Inverse Square Law of Intensity of Light.
8. Study the frequency response of Series & Parallel LCR circuits.
9. Determination of Planck's Constant using LEDs.
10. Determination of Fermi Energy of Copper.
11. Identification of circuit elements in a Black Box and determination of values of the components.
12. Determination of Energy gap of the given Semiconductor.
13. Step Interactive Physical Simulations.
14. Study of motion using spread Sheets
15. Study of Application of Statistics using spread sheets
16. PHET Interactive Simulations(<https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html,prototype>)

COs and POs Mapping (Individual teacher has to fill up)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	2	-	-	-	-	-	-	-	-	-	2
CO2	3	3	-	-	-	-	-	-	-	-	-	2
CO3	3	3	-	-	-	-	-	-	-	-	-	2
CO4	3	2	1	-	1	-	-	-	-	-	-	2
CO5	3	2	1	-	2	-	-	3	3	-	-	2

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped,

Note : The CO-PO mapping values are indicative. The course coordinator can alter the mapping using **Competency and Performance Indicators** mentioned in the **AICTE Exam reforms**.



DEPARTMENT OF PHYSICS

LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2022 - 2023

Course Title: Applied Physics for CSE stream	Course Code : BPHYS202
Total contact hours: L:T:P:S :: 2:2:2:0	Course Type : Integrated
CIE Marks : 50 SEE Marks :50	Total Marks : 100
Semester: I	Academic year : 2022-2023
Lesson plan Author: Dr. K Sujatha, Nagasree G, Dinesh S	Date :29/05/2022

Course Objective:

- To study the essentials of photonics and its application in computer science.
- To study the principles of quantum mechanics and its application in quantum computing.
- To study the electrical properties of materials
- To study the essentials of physics for computational aspects like design and data analysis.

Course Outcomes:

After studying this course, students will be able to:

CO1- Describe the principles of LASERS and Optical fibers and their relevant applications.

CO2 -Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.

CO3- Summarize the essential properties of superconductors and its applications in qubits.

CO4- Illustrate the application of physics in design and data analysis.

CO5- Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

MODULE-1

Week	Days/ Date	Contents of Module Lasers and Optical Fibers	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Einstein's A and B	R,U	CO1
	2	Coefficients and Expression for Energy Density (Derivation), Laser Action,	R,U	CO1
	3	Population Inversion, Metastable State, Requisites of a laser system,	R,U	CO1
	4	Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling(Qualitative), Numerical Problems	R,U,E,C	CO1
2	1	Principle and Structure, Propagation of Light,	R,U	CO1
	2	Acceptance angle and Numerical Aperture (NA),	R,U	CO1
	3	Derivation of Expression for NA, Modes of Propagation, RI Profile, Classification of Optical Fibers,	R,U	CO1
	4	Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems	R,U	CO1

MODULE-2

Week	Days/ Date	Contents of Module Quantum Mechanics	Bloom's Taxonomy Level	Course Outcome (CO)
3	1	de Broglie Hypothesis and Matter Waves, de Broglie wavelength	R,U	CO2
	2	derivation of expression by analogy, Phase Velocity and Group Velocity	R,U	CO2
	3	Heisenberg's Uncertainty Principle and its application (Non existence of electron inside the nucleus - Non Relativistic),	R,U	CO2
	4	Principle of Complementarity, Wave Function, Time independent Schrödinger wave equation (Derivation)	R,U	CO2
4	1	Physical Significance of a wave function and Born Interpretation	R,U	CO2
	2	Expectation value, Eigen functions and Eigen Values,	R,U	CO2
	3	Particle inside one dimensional infinite potential well,	R,U	CO2
	4	Quantization of Energy States, Waveforms and Probabilities. Numerical Problems	R,U	CO2

MODULE-3

Week	Days/ Date	Contents of Module Quantum Computing	Bloom's Taxonomy Level	Course Outcome (CO)
5	1	Introduction to Quantum Computing, Moore's law & its end	R,U	CO2
	2	Differences between Classical & Quantum computing. Concept of qubit and its properties.	R,U	CO2
	3	Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits.	R,U,E	CO2
	4	Matrix representation of 0 and 1 States, Identity Operator I, Applying I to $|0\rangle$ and $|1\rangle$ states, Pauli Matrices and its operations on $|0\rangle$ and $|1\rangle$ states,	R,U	CO2
6	1	Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product),	R,U	CO2
	2	Probability, and Quantum Superposition, normalization rule. Orthogonality, Orthonormality. Numerical Problems	R,U	CO2
	3	Single Qubit Gates: Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate	R,U	CO2
	4	Multiple Qubit Gates: Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of Swap gate, Controlled -Z gate, Toffoli gate.	R,U	CO2

MODULE-4

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
7	1	Resistivity and Mobility, Concept of Phonon, Matheissen's rule,	R,U,	CO3
	2	Failures of Classical Free Electron Theory	R,U	CO3
	3	Assumptions of Quantum Free Electron Theory, Fermi Energy, Density of States,	R,U	CO3
	4	Fermi Factor, Variation of Fermi Factor With Temperature and Energy. Numerical Problems	R,U	CO3
8	1	Introduction to Super Conductors, Temperature dependence of resistivity	R,U	CO3
	2	Meissner's Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative)	R,U	CO3
	3	Quantum Tunnelling, High Temperature superconductivity, Josephson Junctions (Qualitative), DC and RF SQUIDS (Qualitative),	R,U	CO3
	4	Applications in Quantum Computing: Charge, Phase and Flux qubits, Numerical Problems.	R,U	CO3

MODULE-5

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
9	1	Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale	R,U,A2	CO4
	2	Weight and Strength, Motion and Timing in Animations, Constant Force and Acceleration,	R,U	CO4
	3	The Odd rule, Odd-rule Scenarios, Motion Graphs, Examples of Character Animation:	R,U	CO4
	4	Jumping, Parts of Jump, Jump Magnification, Stop Time, Walking: Strides and Steps, Walk Timing	R,U	CO4
10	1	Numerical Problems	R,U,E	CO4
	2	Descriptive statistics and inferential statistics, Poisson distribution and modeling the probability of proton decay,	R,U	CO4
	3	Normal Distributions (Bell Curves), Monte Carlo Method: Determination of Value of π .	R,U	CO4
	4	Numerical Problems	R,U	CO4

**Bloom's Taxonomy Level :R-Remembering U-Understanding A1-Applying
A2-Analysing
E-evaluating C-Creating**

Suggested Learning Resources:

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1. Solid State Physics, S O Pillai, New Age International Private Limited, 8th Edition, 2018.
2. Engineering Physics by Gupta and Gour, Dhanpat Rai Publications, 2016 (Reprint).
3. A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
4. A Textbook of Engineering Physics by M.N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
5. Quantum Computation and Quantum Information, Michael A. Nielsen & Isaac L. Chuang, Cambridge Universities Press, 2010 Edition. 26.10.2022 4
6. Quantum Computing, Vishal Sahani, McGraw Hill Education, 2007 Edition.
- 7 Quantum Computing – A Beginner's Introduction, Parag K Lala, Indian Edition, Mc GrawHill, Reprint 2020.
8. Engineering Physics, S P Basavaraj, 2005 Edition, Subhash Stores.
9. Physics for Animators, Michele Bousquet with Alejandro Garcia, CRC Press, Taylor & Francis, 2016.
10. Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations, Maria Luisa Dalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli, Trends in Logic, Volume 48, Springer.

Web links and Video Lectures (e-Resources):

- LASER: <https://www.youtube.com/watch?v=WgzynzPiyC>
Superconductivity : <https://www.youtube.com/watch?v=MT5Xl5ppn48>
Optical Fiber : https://www.youtube.com/watch?v=N_kA8EpCUQo
Quantum Mechanics : <https://www.youtube.com/watch?v=p7bzE1E5PMY&t=136s>
Quantum Computing : <https://www.youtube.com/watch?v=jHoEjvuPoB8>
Physics of Animation : https://www.youtube.com/watch?v=kj1kaA_8Fu4
Statistical Physics Simulation : https://phet.colorado.edu/sims/html/plinko-probability/latest/plinkoprobability_en.html
NPTEL Quantum Computing : <https://archive.nptel.ac.in/courses/115/101/115101092>
Virtual LAB : <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>
Virtual LAB : <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- <http://nptel.ac.in>
<https://swayam.gov.in>
https://virtuallabs.merlot.org/vl_physics.html
<https://phet.colorado.edu>
<https://www.myphysicslab.com>



Staff

Department of Physics



HOD

Department of Physics



Question Bank

Course Name: Applied Physics for CSE Stream

Course Code: BPHYS202

Semester: II

Section: D, E & F

Module-I

Laser and Optical Fibers:

1. Explain the three possible ways through which radiation interacts with matter.
2. Derive the expression for energy density by using Einstein's coefficients.
3. Explain the requisites and conditions to obtain a laser beam.
4. Explain the construction and working of semiconductor laser with energy level diagram.
5. Explain the applications of lasers in
 - a) Bar code
 - b) Laser printer
 - c) Laser cooling
6. What is Numerical Aperture? Derive the expression for Numerical Aperture with a neat diagram.
7. With neat diagrams explain the different types of optical fibers.
8. What is attenuation. Explain the different types of attenuation mechanisms with neat diagrams.
9. Write a note on applications of optical fibers in
 - a) Fiber optic networking
 - b) Point to point communication
10. Mention the advantages and disadvantages of optical fibers in point-to-point communication.



Module-II

Quantum Mechanics:

1. Explain De-Broglie hypothesis and derive the expression for de Broglie wavelength and what are the characteristics of matter waves.
2. Define phase velocity and group velocity and mention the expression for the same.
3. State and explain Heisenberg's uncertainty principle and its physical significance.
4. Using uncertainty principle prove that free electron cannot exist inside the nucleus.
5. What is a wave function and what are the properties of wave function.
6. Explain a) Max-Born interpretation b) Normalization.
7. Derive the expression for time independent Schrodinger wave equation in one dimension.
8. Using the time independent Schrodinger wave equation obtain the solution for normalized wave function.
9. Find eigenvalues and eigen functions for a particle in one dimensional potential well.
10. Discuss the wave function probability densities and eigen energy values for a free particle in a box by considering the ground state and first two excited states.



Module-III

Quantum Computing

1. State and explain Moore's law.
2. Compare classical and quantum information.
3. Mention the differences between classical and quantum computing.
4. What is qubit? Mention the properties of qubits.
5. What is Bloch sphere? Represent the single qubit states $|0\rangle$ and $|1\rangle$ on the Bloch sphere.
6. Discuss matrix form of single qubit, two qubit states and n-qubits.
7. Compose identity operator? Show that identity operator operates on the states $|0\rangle$ and $|1\rangle$ leaves the same states.
8. Mention the Pauli matrices. Discuss the Pauli matrices operation on $|0\rangle$ and $|1\rangle$ states.
9. Explain conjugate and transpose of matrix.
10. What are unitary, row and column matrix? What is the condition for matrix multiplication or inner product? Give one example.
11. What is unitary operator? Show that $U^\dagger U = U U^\dagger = I$ using the matrix $A = \begin{bmatrix} \cos\theta & i\sin\theta \\ i\sin\theta & \cos\theta \end{bmatrix}$.
12. Explain probability, normalisation, quantum superposition, orthogonality and orthonormality.
13. Explain single qubit quantum NOT gate.
14. Mention unitary operator for Pauli X, Y, Z, and Hadamard quantum gates using tensor product or outer product. Explain the operations of Pauli X, Y, Z, and Hadamard quantum gates on $|0\rangle$ and $|1\rangle$ states. And represent the input and output states on the Bloch sphere.
15. Obtain unitary operator for S (Swap) gate using rotation unitary operator $RZ(\varphi) = e^{-i\varphi/2} \cdot \sigma_Z$. Show that $T = \sqrt{S}$.
16. What are two qubit quantum logic gates? Discuss two qubit quantum NOT gate or controlled NOT gate with four different input states.
17. Discuss two qubit quantum S gate or controlled S gate with four different input states.
18. Discuss two qubit quantum Z gate or controlled Z gate with four different input states.
19. What are three qubit quantum logic gates?
20. Discuss Toffoli or controlled controlled NOT or C2NOT gate with all different 8 (eight) input states.



Module-IV

Electrical Properties of Materials and Applications:

1. Explain in brief classical free electron theory of metals.
2. Explain the effect of temperature and impurity on electrical resistivity of metals. (Matheissen's rule)
3. Explain the failures of classical free electron theory. What are the assumptions of quantum free electron theory.
4. Explain fermi factor and variation of fermi factor with temperature with suitable graph.
5. Explain the temperature dependence of resistivity of metals and superconductors.
6. Explain BCS theory of superconductivity and formation of cooper pairs.
7. Explain Meissner's effect with suitable diagram.
8. Explain critical field and temperature dependence of critical field.
9. Explain the different types of superconductors by giving examples of each with suitable graphs.
10. Write a note on high temperature superconductors.
11. Explain quantum tunneling, Josephson junction and its types.
12. What is a SQUID. Explain DC and RF SQUIDS using diagrams.
13. Explain flux quantization with suitable diagram.
14. What are Qubits and explain flux, charge and phase Qubits.



Module-V

Physics of Animation

1. What is animation. Explain frame and frame per second.
2. Explain a) size and scale b) proportion & scale c) weight and strength.
3. Explain motion and timing in animations
(Linear motion, uniform motion, slow in & slow out)
4. Elucidate constant force and acceleration.
5. Explain the odd rule, odd rule multiplier and odd rule scenarios with examples.
6. Give a brief discussion about motion graphs.
7. Explain jumping and ports of jump in detail.
8. Explain jump magnification and acceleration.
9. Explain the calculation of push time stop time with examples.
10. Elucidate walking and explain strides and steps with neat diagram.
11. Distinguish between descriptive and inferential statistics.
12. Discuss the salient features of normal distribution using bell curves.
13. Mention the general pattern of monte Carlo method and hence determine the value of π .
14. Discuss modelling the probability for proton decay.
15. Explain Poisson distribution & mass function.

Staff

Prof. Nagasree G
Department of Physics

HOD

Dr. Sujatha
Department of Physics



Assignment Questions

Course Name: Applied Physics for CSE Stream

Course Code: BPHYS202

Semester: II

Section: D, E & F

Module-I

Laser and Optical Fibers:

1. Derive the expression for energy density by using Einstein's coefficients.
2. Explain the requisites and conditions to obtain a laser beam.
3. Explain the construction and working of semiconductor laser with energy level diagram.
4. Explain the applications of lasers in
 - a) Bar code
 - b) Laser printer
 - c) Laser cooling
5. What is Numerical Aperture? Derive the expression for Numerical Aperture with a neat diagram.
6. With neat diagrams explain the different types of optical fibers.
7. What is attenuation. Explain the different types of attenuation mechanisms with neat diagrams.
8. Write a note on applications of optical fibers in
 - a) Fiber optic networking
 - b) Point to point communication



CITY
ENGINEERING COLLEGE

Module-II

Quantum Mechanics:

1. Explain De-Broglie hypothesis and derive the expression for de Broglie wavelength and what are the characteristics of matter waves.
2. State and explain Heisenberg's uncertainty principle and its physical significance.
3. Using uncertainty principle prove that free electron cannot exist inside the nucleus.
4. Explain a) Max-Born interpretation b) Normalization.
5. Derive the expression for time independent Schrodinger wave equation in one dimension.
6. Using the time independent Schrodinger wave equation obtain the solution for normalized wave function.
7. Find eigenvalues and eigen functions for a particle in one dimensional potential well.
8. Discuss the wave function probability densities and eigen energy values for a free particle in a box by considering the ground state and first two excited states.



Module-III

Quantum Computing

1. State and explain Moore's law.
2. Compare classical and quantum information.
3. Mention the differences between classical and quantum computing.
4. What is qubit? Mention the properties of qubits.
5. What is Bloch sphere? Represent the single qubit states $|0\rangle$ and $|1\rangle$ on the Bloch sphere.
6. Discuss matrix form of single qubit, two qubit states and n-qubits.
7. Compose identity operator? Show that identity operator operates on the states $|0\rangle$ and $|1\rangle$ leaves the same states.
8. Mention the Pauli matrices. Discuss the Pauli matrices operation on $|0\rangle$ and $|1\rangle$ states.
9. Explain conjugate and transpose of matrix.
10. What are unitary, row and column matrix? What is the condition for matrix multiplication or inner product? Give one example.
11. What is unitary operator? Show that $U^\dagger U = U U^\dagger = I$ using the matrix $A = \begin{bmatrix} \cos\theta & i\sin\theta \\ i\sin\theta & \cos\theta \end{bmatrix}$.
12. Explain probability, normalisation, quantum superposition, orthogonally and orthonormality.
13. Explain single qubit quantum NOT gate.
14. Mention unitary operator for Pauli X, Y, Z, and Hadamard quantum gates using tensor product or outer product. Explain the operations of Pauli X, Y, Z, and Hadamard quantum gates on $|0\rangle$ and $|1\rangle$ states. And represent the input and output states on the Bloch sphere.
15. Obtain unitary operator for S (Swap) gate using rotation unitary operator $RZ(\varphi) = e^{-i\varphi/2} \cdot \sigma_Z$. Show that $T = \sqrt{S}$.
16. What are two qubit quantum logic gates? Discuss two qubit quantum NOT gate or controlled NOT gate with four different input states.
17. Discuss two qubit quantum S gate or controlled S gate with four different input states.
18. Discuss two qubit quantum Z gate or controlled Z gate with four different input states.



CITY
ENGINEERING COLLEGE

Module-IV

Electrical Properties of Materials and Applications:

1. Explain the failures of classical free electron theory. What are the assumptions of quantum free electron theory.
2. Explain fermi factor and variation of fermi factor with temperature with suitable graph.
3. Explain the temperature dependence of resistivity of metals and superconductors.
4. Explain BCS theory of superconductivity and formation of cooper pairs.
5. Explain Meissner's effect with suitable diagram.
6. Explain critical field and temperature dependence of critical field.
7. Explain the different types of superconductors by giving examples of each with suitable graphs.
8. Write a note on high temperature superconductors.
9. Explain quantum tunneling, Josephson junction and its types.
10. What is a SQUID. Explain DC and RF SQUIDS using diagrams.
11. Explain flux quantization with suitable diagram.
12. What are Qubits and explain flux, charge and phase Qubits.



Module-V

Physics of Animation

1. What is animation. Explain frame and frame per second.
2. Explain a) size and scale b) proportion & scale c) weight and strength.
3. Explain motion and timing in animations
(Linear motion, uniform motion, slow in & slow out)
4. Elucidate constant force and acceleration.
5. Explain the odd rule, odd rule multiplier and odd rule scenarios with examples.
6. Give a brief discussion about motion graphs.
7. Explain jumping and ports of jump in detail.
8. Explain jump magnification and acceleration.
9. Explain the calculation of push time stop time with examples.
10. Elucidate walking and explain strides and steps with neat diagram.
11. Distinguish between descriptive and inferential statistics.
12. Discuss the salient features of normal distribution using bell curves.
13. Mention the general pattern of monte Carlo method and hence determine the value of π .

Staff

Prof. Nagasree G
Department of Physics

HOD

Dr. Sujatha
Department of Physics

USN

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

SUB CODE: BPHYS202

CITY ENGINEERING COLLEGE

I Internal Test

Branch, Sec, Sem: CS, D/E/F, 2nd Sem
 Course Title: Applied Physics for CS Stream
 Max Marks: 25

Date: 11/07/2023
 Time: 10:30-11:30
 Duration: 1 hr

Note: Answer all Questions selecting any ONE FULL question from each part

Q.No.	Question	Marks	CO's
PART-A			
1	Explain the construction and working of semiconductor laser	5	CO1
OR			
2	The ratio of population of two energy levels is 1.059×10^{-30} . Find the wavelength of light emitted by spontaneous emission at 330 K.	5	CO1
PART-B			
3	With neat diagrams explain the different types of optical fibers.	5	CO1
OR			
4	Explain different types of attenuation with neat diagrams.	5	CO1
PART-C			
5	Explain Heisenberg's uncertainty principle and prove that electron does not exist inside the nucleus.	5	CO2
OR			
6	Calculate the momentum of an electron if its de Broglie wavelength associated with it if its kinetic energy is 1.5 KeV.	5	CO2
PART-D			
7	Derive the expression for Time independent one dimensional Schrodinger wave equation.	5	CO2
OR			
8	An optical fiber has a core material of R.I 1.55 and its cladding has a R.I of 1.50. Calculate its numerical aperture and acceptance angle.	5	CO1
PART-E			
9	Derive the expression for Numerical Aperture with neat diagram.	5	CO1
OR			
10	Explain the construction and working principle of Laser Printer.	5	CO1

Course Outcomes: -

CO1--Describe the principles of Laser and optical fibers and their relevant application.

CO2--Discuss the basic principles of the Quantum mechanics and its applications.

CO3--Summarize the essential properties of superconductors and its applications in qubits.

CO4--Illustrate the application of physics in design and data analysis.

CO5--Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Bloom's Taxonomy Level:

**BT1—Remembering BT2---Understanding BT3---Applying BT4---Analyzing BT5--
--Evaluating BT6 ---Creating**

CITY ENGINEERING COLLEGE
DEPARTMENT OF Physics
SCHEME FOR VALUATION
Internal Test I

Semester & Section: 2nd / D, E, F

Date: 11/07/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
	<u>Part-A</u>		
①	Construction with explanation working with explanation diagrams and expression Applications	1M 2M 1M 1M	5M
②	<p>(OR)</p> <p>Data - $N_2/N_1 = 1.059 \times 10^{-30}$ $T = 330 \text{ K}$ To find - $\lambda = ?$ $\frac{N_2}{N_1} = e^{-hc/\lambda kT}$ $\lambda = 632 \text{ nm}$</p>	1M 2M 2M	5M
	<u>Part-B</u>		
③	Three types of optical fibers with diagrams and explanation	5M	5M
④	Three types of Attenuations with diagrams and explanation	5M	5M

Staff

HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: 2nd / D, E, F

Date: 11/07/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
⑤	<p style="text-align: center;"><u>Post-C</u></p> <p>HUP statement explanation expressions</p> <p>Application - curve up to $E \geq 85 \text{ MeV}$</p>	<p>1M 1M 1M 2M</p>	5M
⑥	<p><u>Data</u> - K.E, $E = 1.5 \text{ KeV}$ $= 1.5 \times 10^3 \times 1.6 \times 10^{19} \text{ J}$</p> <p><u>to find</u> - $P = ?$ $\lambda = ?$</p> <p>W.K.T $P = \sqrt{2mE} \cdot \lambda = \frac{h}{\lambda} \cdot \lambda$</p> <p>$P = 2.09 \times 10^{-23} \text{ kg m/s}$ $\lambda = 3.17 \times 10^{-11} \text{ m}$</p>	<p>1M 2M 1M 1M</p>	5M
	<p><u>Post-D</u></p>		

GA
Staff

VS
HOD

CITY ENGINEERING COLLEGE
DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: 2nd / D, E, F

Date: 11/07/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
7	<p style="text-align: center;"><u>Part - D</u></p> <p>$d = h/p, \quad \psi = Ae^{i(kx - \omega t)}$</p> <p>arrive up to $\frac{d^2\psi}{dx^2} + k^2\psi = 0$</p> $\frac{1}{\lambda^2} = -\frac{1}{4\pi^2\psi} \frac{d^2\psi}{dx^2}$ <p>$E = K.E + P.E$</p> <p>arrive up to</p> $\frac{d^2\psi}{dx^2} + \frac{8\pi^2m}{h^2} (E - V)\psi = 0$ <p style="text-align: center;">(B)</p>	<p>1M</p> <p>1M</p> <p>1M</p> <p>2M</p>	<p>5M</p>
8	<p><u>Data</u> - $n_1 = 1.50$ $n_2 = 1.50$</p> <p><u>To find</u> - $N.A = ?$ $\theta = ?$</p> <p>W.K.T $N.A = \sqrt{n_1^2 - n_2^2}, \quad \theta = \sin^{-1}(N.A)$</p> <p>$N.A = 0.39$ $\theta = 23^\circ$</p>	<p>1M</p> <p>2M</p> <p>2M</p>	<p>5M</p>

GA
Staff

VP
HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics
SCHEME FOR VALUATION

Internal Test I

Semester & Section: 2nd / D.E.F

Date: 11/07/23

Question No.	Details of the answer	Marks Distribution	Total Marks
<p>(9)</p>	<p><u>Part - E</u></p> <p>Numerical Aperture Explanation with diagram</p> <p>Arrive up to $NA = \sqrt{n_1^2 - n_2^2}$</p> <p>$= \sin \theta$</p> <p>$\theta = \sin^{-1}(NA)$</p> <p>and $\sin \theta_e < \sin \theta_o$</p>	<p>2M</p> <p>2M</p> <p>1M</p>	<p>5M</p>
<p>(10)</p>	<p>(3i)</p> <p>Construction diagram and explanation</p> <p>Worky principle with suitable diagram</p>	<p>2M</p> <p>2M</p> <p>1M</p>	<p>5M</p>


Staff


HOD

USN

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



CITY ENGINEERING COLLEGE

II Internal Test

Branch, Sec, Sem: CS, D/E/F, 2nd Sem

Course Title: Applied Physics for CSE Stream

Max Marks: 25 Sub Code: BPHYS202

Date: 05/09/2023

Time: 10:30-11:30

Duration: 1hr

Note: Answer All Questions selecting any ONE FULL question from each part

Q.No.	Question	Marks	CO's
PART-A			
1	Explain the differences between classical and quantum computing.	5	CO2
OR			
2	Show that matrix, $A = \begin{bmatrix} 1/\sqrt{2} & 1/\sqrt{2} \\ 1/\sqrt{2} & 1/\sqrt{2} \end{bmatrix}$ is Unitary	5	CO2
PART-B			
3	Explain Fermi factor and variation of Fermi factor with temperature with a suitable graph.	5	CO3
OR			
4	Calculate the probability of an electron occupying an energy level 0.02 eV above the Fermi level at 200 K and 400 K in a material.	5	CO3
PART-C			
5	Explain Pauli matrices. Discuss the Pauli matrices operation on $|0\rangle$ and $|1\rangle$ states. Given $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, $X = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$, $Y = \begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix}$, $Z = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$	5	CO2
OR			
6	Discuss two qubit Controlled Not gate (CNOT) with four different input states and truth table.	5	CO2
PART-D			
7	Explain BCS theory of Superconductivity with the formation of cooper pairs.	5	CO3
OR			
8	What is a SQUID ? Explain DC and RF SQUIDS using diagrams.	5	CO3
PART-E			
9	Explain different types of Superconductors with suitable graph and examples	5	CO3
OR			
10	Explain representation of Qubit using Bloch Sphere.	5	CO2

Course Outcomes: -

CO1--Describe the principles of Laser and optical fibers and their relevant application.

CO2--Discuss the basic principles of the Quantum mechanics and its applications.

CO3--Summarize the essential properties of superconductors and its applications in qubits.

CO4--Illustrate the application of physics in design and data analysis.

CO5--Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Bloom's Taxonomy Level:

**BT1—Remembering BT2---Understanding BT3---Applying BT4---Analyzing BT5--
--Evaluating BT6 ---Creating**

CITY ENGINEERING COLLEGE
DEPARTMENT OF Physics
SCHEME FOR VALUATION
Internal Test I

Semester & Section: 2nd / D, E, F

Date: 11/07/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
	<u>Part-A</u>		
①	Construction with explanation working with explanation diagrams and expression Applications	1M 2M 1M 1M	5M
②	<p style="text-align: center;">(OR)</p> Data - $N_2/N_1 = 1.059 \times 10^{-30}$ $T = 330 \text{ K}$ To find - $\lambda = ?$ $\frac{N_2}{N_1} = e^{-hc/\lambda kT}$ $\lambda = 632 \text{ nm}$	1M 2M 2M	5M
	<u>Part-B</u>		
③	Three types of optical fibers with diagrams and explanation	5M	5M
④	Three types of Attenuations with diagrams and explanation	5M	5M

~~GA~~
Staff

~~VJ~~
HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: 2nd / D, E, F

Date: 11/07/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
⑤	<p style="text-align: center;"><u>Post-C</u></p> <p>HUP statement explanation expressions Application - wave up to $E \geq 85 \text{ MeV}$</p>	<p>1M 1M 1M 2M</p>	<p>5M</p>
⑥	<p style="text-align: center;">(09)</p> <p><u>Data</u> - K.E, $E = 1.5 \text{ KeV}$ $= 1.5 \times 10^3 \times 1.6 \times 10^{-19} \text{ J}$ to find - $P = ?$ $\lambda = ?$ W-KT $P = \sqrt{2mE}$ $\lambda = \frac{h}{\sqrt{2mE}}$ $P = 2.09 \times 10^{-23} \text{ kg m/s}$ $\lambda = 3.17 \times 10^{-11} \text{ m}$</p> <p style="text-align: center;"><u>Post-D</u></p>	<p>1M 2M 1M 1M</p>	<p>5M</p>

GS
Staff

VS
HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal TestI

Semester & Section: 2nd / D, E, F

Date: 11/07/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
7	<p style="text-align: center;"><u>Part - D</u></p> <p>$d = h/p, \quad \psi = Ae^{i(kx - \omega t)}$</p> <p>solve up to $\frac{d^2\psi}{dx^2} + k^2\psi = 0$</p> $\frac{1}{\lambda^2} = -\frac{1}{4\pi^2\psi} \frac{d^2\psi}{dx^2}$ <p>$E = K.E + P.E$</p> <p>solve up to</p> $\frac{d^2\psi}{dx^2} + \frac{8\pi^2m}{h^2} (E - V)\psi = 0$ <p style="text-align: center;">(8)</p>	<p>1M</p> <p>1M</p> <p>1M</p> <p>2M</p>	<p>5M</p>
8	<p><u>Data</u> - $n_1 = 1.50$</p> <p>$n_2 = 1.50$</p> <p><u>To find</u> - $N.A = ?$</p> <p>$\theta = ?$</p> <p>W.K.T $N.A = \sqrt{n_1^2 - n_2^2}, \quad \theta = \sin^{-1}(N.A)$</p> <p>$N.A = 0.39$</p> <p>$\theta = 23^\circ$</p>	<p>1M</p> <p>2M</p> <p>2M</p>	<p>5M</p>

Staff

HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: 2nd / D, E, F

Date: 11/07/23

Question No.	Details of the answer	Marks Distribution	Total Marks
<p>(9)</p>	<p><u>Part - E</u></p> <p>Numerical Aperture Explanation with diagrams</p> <p>Arrive up to $NA = \sqrt{n_1^2 - n_2^2}$</p> <p>$\geq \sin \theta$</p> <p>$\theta = \sin^{-1}(NA)$</p> <p>and $\sin \theta_e < \sin \theta_o$</p> <p>(3)</p>	<p>2M</p> <p>2M</p> <p>1M</p>	<p>5M</p>
<p>(10)</p>	<p>Construction diagrams and explanation</p> <p>Worby principle with suitable diagram</p>	<p>2M</p> <p>2M</p> <p>1M</p>	<p>5M</p>

Staff

HOD

Year : 20 22- 20 23

Semester : Odd / Even ✓

Name of the Teacher : Dr. K. Sujatha

Designation : Prof & HOD

Department : Physics

II SEM
2022-23

CSE BRANCH

D - SECTION

Sem/Branch

Subject Code

Subject

1. II Sem CSE Branch B.PHYS 202 Applied Physics for
CSE Stream
2. D - Section
- 3.

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	<u>Ksujatha</u> 28/6/23	<u>Ks</u> 31/7/23	<u>Ks</u> 24/8/23	<u>Prof Ks</u>
HOD	<u>Ks</u>	<u>Ks</u>	<u>Ks</u>	<u>Ks</u>
Principal	<u>Dr. S. S. Srinivas</u> PRINCIPAL			

CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTENDANCE

Sl. No.	Reg. No.	Name D-Section	23	23	23	23	23	23	23	23	23	23	23
			5	5	6	6	6	6	6	6	6	6	6	6
			29	31	1	5	7	8	10	12	13	15	19
			1	2	3	4	5	6	7	8	9	10	11
1	22GS001	Aaryan Sahu	.	.	1	2	3	4	5	6	7	7	6
2	GS002	Abhinandan Rajendra Havannakar	1	2	3	4	5	6	7	8	9	9	10
3	GS003	Abhishek K	1	2	3	4	5	6	7	8	9	10	11
4	GS004	Abhishek Kumar	1	2	3	4	5	6	7	8	9	10	11
5	GS005	Abhishek M.K	.	1	2	3	4	5	6	7	8	8	9
6	GS006	Abhishek S. Guler	1	2	3	4	5	6	7	8	9	9	10
7	GS007	Adarsha	1	2	3	4	5	6	7	8	9	9	10
8	GS008	Adithya Kumar	.	1	2	3	4	5	6	7	8	9	10
9	GS009	Aashwaryya K.H	1	2	3	4	5	6	7	8	8	8	9
10	GS010	Amith D	.	1	2	3	4	5	6	7	8	9	10
11	GS011	Amrutha B.K	.	1	2	3	4	5	6	6	7	8	9
12	GS012	Aneesh S	1	2	3	4	5	6	7	8	8	9	10
13	GS013	Anjali	.	1	2	3	4	5	6	7	8	9	10
14	GS014	Anusha A	1	2	3	4	5	6	7	8	9	9	10
15	GS015	Anusha B.T	.	1	2	3	4	5	6	7	8	9	10
16	GS017	Axayind Shrimanth chawan	.	1	2	3	4	5	6	7	8	9	10
17	GS019	Arpitha A	1	2	3	4	5	6	7	8	9	10	11
18	GS018	Arpitha M	1	2	3	4	5	6	7	8	9	10	11
19	GS020	Arunkumar D	1	2	3	4	5	6	7	8	9	10	11
20	GS021	Ashik K. Shetty	1	2	3	4	5	6	7	8	9	10	11
21	GS022	Ashritha S	1	2	3	4	5	6	7	8	9	10	11
22	GS023	B. Prasanna	.	1	2	3	4	5	6	7	8	8	9
23	GS024	B.S. Akshatha	.	1	2	3	4	5	6	7	8	9	10
24	GS025	Balaji	.	2	3	4	5	6	7	8	8	9	10
25	GS026	Banupriya B	.	1	2	3	4	5	6	7	8	9	
No. of Absents													
Initials													

23	23	23	23	23	23	23	23	23	23	23	23	23	23
6	6	6	6	6	6	7	7	7	7	7	7	7	7
29	22	24	24	26	28	3	5	6	10				
12	13	14	15	16	17	18	19	20	21				
7	8	8	9	10	11	12	13	13	14				
10	11	11	12	13	14	15	16	17	18				
12	13	14	15	16	17	18	18	18	19				
12	13	14	15	16	16	17	18	19	20				
10	11	11	12	13	14	15	15	16	17				
10	11	12	13	14	14	15	15	16	17				
11	12	13	13	14	14	15	16	16	17				
11	12	13	14	15	15	16	17	18	19				
10	11	12	13	14	14	15	16	17	18				
11	12	13	13	14	15	16	17	18	19				
10	11	12	13	14	14	15	16	17	18				
11	12	13	13	14	15	16	17	18	19				
11	12	13	14	15	16	17	18	19	20				
10	11	12	13	14	14	15	16	17	18				
11	12	13	13	14	15	16	17	18	19				
11	12	13	13	14	15	16	17	18	19				
12	13	14	14	15	15	16	17	17	18				
12	13	14	14	15	15	16	17	18	19				
11	12	13	13	14	15	16	17	18	19				
12	13	14	15	16	16	17	18	19	20				
12	13	14	15	16	17	18	19	20	21				
10	11	12	12	13	14	15	16	17	18				
10	11	12	12	13	14	15	16	17	18				
11	12	13	13	14	15	16	17	18	19				
10	11	12	13	14	15	16	17	18	19				

ATTENDANCE

Sl. No.	Reg. No.	Name	23	23	23	23	23	23	23	23	23	23	23	23
			5	5	6	6	6	6	6	6	6	6	6	6	6
			29	31	1	5	7	8	10	12	13	15	19	
			1	2	3	4	5	6	7	8	9	10	11	
26	CS027	Bhagya Jyothi	1	2	3	3	4	5	6	7	7	8		
27	CS070	K.S. Bhavanesi	1	2	3	4	5	6	7	8	9	10	11	
28	CS028	Bhavani. M	1	2	3	4	5	6	7	7	8	9	9	
29	CS030	Chethanya	1	2	3	4	5	6	7	8	8	9	9	
30	CS031	Chandana. P	1	2	3	4	5	6	7	8	9	10	11	
31	CS032	Chandana. S	1	1	2	2	3	4	5	5	6	6	7	
32	CS033	Chandresh Kushal. G.R.	1	1	2	3	4	5	6	7	8	9	10	
33	CS034	Chethan Kumar G.S.	1	2	3	4	5	6	7	8	9	10	11	
34	CS035	Chinmayi S	1	2	3	3	4	5	6	7	8	9	10	
35	CS036	D. U. Vamsi	1	1	2	3	4	5	6	7	8	8	9	
36	CS037	Darshan. B.	1	2	3	4	5	6	7	8	9	10	11	
37	CS038	Darshan. M.	1	2	3	4	4	5	6	7	8	9	10	
38	CS039	Darshan. T.S.	1	2	3	4	5	6	7	8	9	10	11	
39	CS040	Deekshith Kumar Devraj. Naik	1	1	2	3	4	5	5	6	7	8	9	
40	CS041	Dhanalakshmi. K	1	2	3	4	5	6	7	8	9	10	11	
41	CS042	Dhanush. S	1	1	2	3	4	4	5	5	6	7	8	
42	CS044	Dinesh Kumar. M	1	2	3	4	5	6	7	8	9	10	11	
43	CS045	Durgesh. K	1	2	3	4	5	6	7	8	9	10	11	
44	CS046	G. Kavya	1	2	3	4	5	6	7	8	9	10	11	
45	CS048	Gavi Siddappa	1	1	2	2	3	4	5	6	7	8	9	
46	CS049	Gokula Lakshmi. M	1	2	3	4	5	6	7	8	9	10	11	
47	CS050	Goutham. L	1	1	2	3	4	5	6	6	7	7	8	
48	CS051	H. V. Shankar	1	1	2	3	4	4	5	6	7	8	9	
49	CS053	Hanumanth Bangargi	1	1	2	3	4	5	6	7	8	9	10	
50	CS054	Harini. V												
No. of Absents														
Initials														

23	23	23	23	23	23	23	23	23	23	23	23	23	23
6	6	6	6	6	6	6	7	7	7	7	7	7	7
21	22	24	24	26	28	5	5	6	10				
12	13	14	15	16	17	18	19	20	21				
8	9	10	11	12	13	14	15	15	16				
11	12	13	14	15	16	17	18	19	20				
10	11	11	12	13	13	14	15	16	17				
10	11	12	13	14	15	16	17	18	19				
12	13	14	15	16	16	17	18	19	20				
8	9	10	11	12	13	14	15	16	16				
11	12	12	13	14	15	16	17	18	18				
12	13	13	14	15	16	17	18	19	19				
11	12	13	14	15	15	16	17	18	18				
10	11	12	13	14	14	15	16	17	18				
12	13	14	15	16	16	17	18	18	19				
11	12	12	13	14	15	16	17	18	19				
10	11	12	13	14	14	15	16	17	18				
12	13	13	14	15	16	17	18	19	20				
9	10	11	12	13	13	14	15	16	17				
12	13	13	13	14	15	16	17	18	19				
12	13	14	15	16	17	18	19	20	20				
10	11	12	13	14	15	16	17	18	19				
12	13	14	15	16	17	18	19	20	20				
9	10	11	11	12	12	13	14	15	16				
10	11	12	13	14	14	15	16	16	17				
10	11	11	12	13	13	14	15	16	16				



CITY
ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE
ACADEMIC YEAR 22-23 ODD SEMESTER
CIRCULAR

Ref No: CEC/BS/DAC/ACY 2022-23/OR/01

Date: 30-11-2022

This is to inform the members of Department Advisory Committee that meeting is scheduled on 01-12-2022 at 10: 00 AM in Physics Laboratory.

Agenda:

- Commencement of classes for 1st semester students
- Phase I Student Induction Programme for 1st semester students
- Conduction of Talents Day
- Organizing value added courses/ circular courses in the curriculum

HOD

Dr. Jyothi P

Department of Mathematics

HOD Department of Mathematics
City Engineering College
Doddakallasandra, Bangalore-62



CITY
ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE
Department Advisory Committee Meeting

Date: 01-12-2022

Time: 10:00 AM

Venue: Physics Laboratory

List of DAC Members

Sl. No	Member Name	Designation	Role	Signature
1	Dr. Rajasekhar. P	HOD & Professor	Convenor	
2	Dr. Jyothi. P	HOD & Professor	Member	
3	Mrs. Nagasree G	Assistant Professor	Member	
4	Dr. Sunitha. N	Associate Professor	Member	
5	Mrs. Vanitha. G R	Assistant Professor	Member	
6	Mr. Rekha. R	Assistant Professor	Member	
7	Mrs. Anitha. C. V	Assistant Professor	Member	
8	Ms. Janavi. R	Assistant Professor	Member	
11	Mr. Arjun	Assistant Professor	Member	
12	Mr. Sadashiva. R	Assistant Professor	Member	
13	Mr. Dinesh	Assistant Professor	Member	
14.	Mr. Sudish Kumar. N	TCS, Manager.	Member	

Agenda of the Meeting:

- Commencement of classes for 1st semester students from 14th December 2022.
- Phase I Student Induction Programme for 1st semester students on 5th to 13th December 2022.
- Conduction of Talents day
- Organizing value added courses/ circular courses in the curriculum like Basic Entrepreneurship Skills, Personal Enrichment Skills.
- National Mathematics Day is celebrated on 22 December to mark the birth anniversary of legendary Indian mathematician, Srinivasa Ramanujan as to be celebrated as Ramanujam Day on 22/12/2022.



CITY
ENGINEERING COLLEGE

Minutes of Meeting:

The members discussed suggestions for improvement and reviewed the meeting agenda.

- The committee decided to organize value added course on Basic Entrepreneurship Skills, Personal Enrichment Skills by considering industry expert views from 20th to 24th February, 2023.
- It was proposed to conduct Ramanujam Day on 22/12/2022 to mark the birth anniversary of legendary Indian mathematician, Srinivasa Ramanujan.
- It was discussed to conduct Talents Day and sports day.

Convenor

Dr. Rajasekhar. P
Department of Chemistry

Dr P. RAJASEKHAR,
M.Sc; M.Phil; Ph.D
HEAD OF THE DEPT. OF CHEMISTRY
CITY ENGINEERING COLLEGE,
Doddakallasandra, Kanakapura Main Road
BANGALORE - 560 062.
Ph (O) 26669313 (M) 92428 92734

HOD

Dr. Jyothi P
Department of Mathematics

HOD Department of Mathematics
City Engineering College
Doddakallasandra, Bangalore-62



ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"JnanaSangama" Belagavi-590018, Karnataka, India

Prof. Dr. B. E. Rangaswamy, Ph.D.
REGISTRAR(I/C)

Phone: (0831) 2498100
Fax : (0831) 2405467

REF: VTU/BGM/ACA/2022-23/ 4197

DATE: 19 NOV 2022

Revised-NOTIFICATION

Subject: - Revised-Academic Calendar of 1st semesters of B.E./B.Tech./B.Arch./B.Plan., programs of University regarding...

Reference: The Hon'ble Vice-Chancellor's approval dated: 18.11.2022

The revised-academic calendar concerned to 1st semester of B.E./B.Tech./B.Arch./B.Plan., programs of University for academic year 2022-23 are hereby notified as mentioned below;

Revised Academic Calendar for I Semester of UG programs for the Academic Year 2022-23 (Tentative)			
Details	I semester B.E./B.Tech.	I semester B.Arch.	I semester B.Plan
**Induction Program	01.12.2022 To 10.12.2022	01.12.2022 To 10.12.2022	01.12.2022 To 10.12.2022
Commencement of I semester Classes	12.12.2022	12.12.2022	12.12.2022
Last Working day of I Semester	31.03.2023	31.03.2023	31.03.2023
Practical Examinations	03.04.2023 To 14.04.2023	03.04.2023 To 14.04.2023	03.04.2023 To 14.04.2023
Theory Examinations	17.04.2023 To 10.05.2023	17.04.2023 To 10.05.2023	17.04.2023 To 10.05.2023
Commencement of II Semester	15.05.2023	15.05.2023	15.05.2023

Please Note:

- The academic sessions for ODD semesters should commence on the **date mentioned** above.
- ** Induction Program** shall be conducted for 10 days at the beginning of 1st semester and 11 days at the beginning of the 2nd semester.

R

During the induction program, college must brief about the new curriculum implemented from the academic year 2022-23.

- The Institute needs to function for **six days** a week with Saturday being half a working day. #if required, the college can also plan to have extra classes on Saturday afternoons and Sundays full day to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges**. If any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- AICTE Activity point details circular will be issued by the Registrar's office separately.
- If any clarification/correction, please email to - sbhvtuso@yahoo.com

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges, Chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering, Electronics & Communication Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. Special Officer QPDS VTU Belagavi for information
4. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
5. The Director I/c. ITI SMU, VTU Belagavi for information and to make arrangements to upload Academic Calendar on the VTU web portal.
6. The Director of Physical Education, VTU Belagavi for information
7. OS for information and make arrangements to send the circular regarding AICTE Activity Points
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

Reg 19/11/22 BE
REGISTRAR
F.



CITY ENGINEERING COLLEGE, BENGALURU-560061. DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES ACADEMIC CALENDAR 2022-23 (ODD SEM)

SEPTEMBER 2022		OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEB 2023		
DAY	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT
					1	RAJYOTSAVA						
WED					2						1	
THU	1				3		1	MOM ON CURRICULUM			2	3 RD SEM -III CIE
FRI	2				4		2	MOM ON CURRICULUM ENRICHMENT			3	
SAT	3		1		5		3				4	
SUN	4		2		6		4			1	5	
MON	5		3		7		5	INAUGRATION and ORIENTATION - 1 ST SEM	2	3 RD -II CIE 7 TH SEM VTU PRACTICAL EXAM STARTS	6	
TUE	6		4	AYUDHA POOJA	8		6		3		7	
WED	7		5	VIJAYA DASHAMI	9		7		4		8	
THU	8		6		10		8	TALENTS DAY	5		9	
FRI	9		7		11	KANAKADASA JAYANTHI	9		6	10		
SAT	10	2 ND SATURDAY HOLIDAY	8	2 ND SATURDAY HOLIDAY	12	2 ND SATURDAY HOLIDAY	10	2 ND SATURDAY HOLIDAY	7	11	3 RD SEM LWD 2 ND SATURDAY HOLIDAY	
SUN	11		9		13		11		8	12		
MON	12		10	START OF 5 TH SEM / START OF I SEM	14		12	5 TH SEM II-CIE	9	13	5 TH SEM THEORY EXAM 3 RD SEM PRACTICAL EXAM	
TUE	13	MOM ON CURRICULUM MOM ON CURRICULUM ENRICHMENT	11		15	5 TH I-CIE	13		10	14		
WED	14		12		16		14	START OF 1 ST SEM	11	15		
THU	15		13		17		15		12	16		
FRI	16		14		18		16		13	17	TALENTS DAY	
SAT	17		15		19		17		14	18	2 ND SATURDAY HOLIDAY	
SUN	18		16		20		18		15	19	MAKARA SANKRANTHI	
MON	19	START OF 7 TH SEMESTER	17	7 TH SEM-I CIE	21	7 TH SEM-II CIE	19	7 TH SEM-III CIE	16	7 TH SEM VTU THEORY 5 TH SEM III CIE	20	
TUE	20		18		22		20		17	5 TH SEM III CIE	21	
WED	21		19		23		21		18	5 TH SEM III CIE	22	3 RD SEM THEORY EXAM
THU	22		20		24		22		19	23		
FRI	23		21		25		23		20	24		
SAT	24	4 TH SATURDAY HOLIDAY	22	4 TH SATURDAY HOLIDAY	26	4 TH SATURDAY HOLIDAY	24	4 TH SATURDAY HOLIDAY	21	25	4 TH SATURDAY HOLIDAY	
SUN	25		23		27		25	CHRISTMAS	22	26		
MON	26		24	NARAKA CHATURDASHI	28	3 RD SEM-I CIE	26		23	27		
TUE	27		25		29		27		24	28		
WED	28		26	BALIPADYAMI	30		28		25	26	REPUBLIC DAY	
THU	29		27				29		27	5 TH SEM LWD		
FRI	30		28				30		28			
SAT			29				31	7 TH SEM LAST WORKING DAY	29	30	4 TH SATURDAY HOLIDAY	
SUN			30						30	5 TH SEM EXAM -PRACTICAL EXAM		
MON			31	START OF 8 RD SEM					31			
TUE												


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 KanaKapura Main Road, BANGALORE - 560 061



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23

DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

COURSE PREFERENCE

Name of the Faculty: Dr. Sujatha K

Designation: Professor and HOD

Sl. No	Course Code and Name	Year/Semester
1.	BPHYS102 Applied Physics for EEE Scheme For C sections	2022/I

HOD

Department of Physics

Signature of Faculty

Department of Physics



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23

DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

COURSE PREFERENCE

Name of the Faculty: Mrs. Nagasree G

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	BPHS102 Applied Physics for Computer Science & Engineering Scheme For A, B section	2022/I

HOD

Department of Physics

Signature of Faculty

Department of Physics



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23

DEPARTMENT OF APPLIED SCIENCE & HUMANITIES
COURSE PREFERENCE

Name of the Faculty: Mr. Dinesh S

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	BPHYSL102, BPHYEL102 Applied Physics for Computer Science & Engineering Scheme and EEE Scheme - Laboratory	2022/I

HOD

Department of Physics

Signature of Faculty

Department of Physics



**TIME TABLE –FIRST SEMESTER DECEMBER – 2022-23
PHYSICS CYCLE**

SECTION: A

BRANCH: AI&ML

ROOM NO: 007

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 - 12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	ESC144	PHYS	BREAK	MATS	KSK	LUNCH	←---PHYL/POPL/MATL /A1/A2/A3---→		
TUE	POP	←PHYL/		POPL /MATL /A2/A3/A1→					
WED	PHYS	ETC15H		MATS	ENG		←---PHYL/POPL/MATL /A3/A1/A2---→		
THU	POP	IDT		ESC144	PHYS				
FRI	ETC15H	ETC15H		MATS	KAN(KBK)		DEPT/COLLEGE ACTIVITIES/		
SAT	ESC144	MATS(T)		PHY (T)	Proctor Meeting A1/A2/A3		LIBRARY		

SUBJECT CODE	SUBJECT NAME	NO. OF HOURS	FACULTY NAME
BMATS101	Mathematics for CSE Stream	4	Rekha.R
BPHYS102	Physics for CSE Stream	4	Nagashree.G
BPOPS103	Principles of Programming using C	2	Arshiya
BESCK104D	Introduction to Mechanical Engineering	3	Mathenullah Shariff
BETCK105H	Introduction to Internet of Things	3	Deepika
BENGK106	Communicative English	1	Arjun
BKSKK107/BKBKK107	Samskruthika Kannada/ Balake Kannada	1	Deepa.G
BIDTK158	Innovation & Design Thinking	1	Manjunath
MATL	Mat Lab	3x3	Anitha / Janavi
PHYL	Physics Lab	3x3	Dr. K. Sujatha / Nagashree. G
POPL	C-Programming Lab	3x3	Arshiya /Gangappa. D

KS

HOD

Dr. Sujatha
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 091

PRINCIPAL



TIMETABLE –FIRST SEMESTER – DECEMBER – 2022-23
PHYSICS CYCLE

SECTION: B

BRANCH: IS

ROOM NO: A006

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 - 12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON	ETC15H	MATS	BREAK	POP	PHYS	LUNCH				
TUE	ETC15H	ETC15H		KSK	POP		←-PHYL/ POPL/MATL /B1/B2/B3-→			
WED	ESC144	←PHYL/		POPL /MATL /B2/B3/B1→						
THU	MATS	PHYS		ESC144	ENG		←- PHYL/POPL/MATL/B3/B1/B2-→			
FRI	PHYS	ESC144		MATS	KAN(KBK)		DEPT/COLLEGE ACTIVITIES/			
SAT	MATS(T)	PHY(T)		IDT	Proctor Meeting B1/B2/B3		LIBRARY			

SUBJECT CODE	SUBJECT NAME	NO OF HOURS	FACULTY NAME
BMATS101	Mathematics for CSE Stream	4	Anitha
BPHYS102	Physics for CSE Stream	4	Nagashree.G
BPOPS103	Principles of Programming using C	2	Arshiya
BESCK104D	Introduction to Mechanical Engineering	3	Harsha Vardhan.U
BETCK105H	Introduction to Internet of Things	3	Deepika
BENGK106	Communicative English	1	Arjun
BKSKK107/BKBKK107	Samskruthika Kannada/ Balake Kannada	1	Deepa.G
BIDTK158	Innovation & Design Thinking	1	Manjunath
MATL	Mat Lab	3x3	Anitha / Janavi
PHYL	Physics Lab	3x3	Dr. K Sujatha / Nagashree.G
POPL	C-Programming Lab	3x3	Arshiya /Gangappa. D

KS

HOD

(Signature)
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanshapura Main Road, BANGALORE - 560 061

PRINCIPAL



TIMETABLE –FIRST SEMESTER – DECEMBER – 2022-23
PHYSICS CYCLE

SECTION: C

BRANCH: EC

ROOM NO: A005

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON	ESC145	← PHYL/	BREAK	CPL /MATL/C1/C2/C3→		LUNCH	BEE	ENG		
TUE	PHYE	ESC145		MATE	BEE					
WED	ETC15H	MATE		BEE	PHYE		DEPT/COLLEGE ACTIVITIES/LIBRARY			
THU	ETC15H	← PHYL/		CPL /MATL/C2/C3/C1→						
FRI	MATE	PHYE		KSK	KAN(KBK)		←-PHYL/ CPL/MATL/C3/C1/ C2-→			
SAT	PHYE(T)	MAT(T)		ETC15H	IDT		Proctor Meeting C1/C2/C3			

SUBJECT CODE	SUBJECT NAME	NO OF HOURS	FACULTY NAME
BMATS101	Mathematics for EEE Stream	4	Dr. Jyothi.P
BPHYS102	Physics for EEE Stream	4	Dr. K. Sujatha
BPOPS103	Basic Electronics	3	Dr. Ravindra.
BESCK104D	Introduction to C-Programming	3	Gangappa. D
BETCK105H	Introduction to Internet of Things	3	Deepika
BENGK106	Communicative English	1	Arjun
BKSKK107/BKBBK107	Samskruthika Kannada/ Balake Kannada	1	Deepa.G
BIDTK158	Innovation & Design Thinking	1	Manjunath
MATL	Mat Lab	3x3	Anitha / Janavi
PHYL	Physics Lab	3x3	Dr. K Sujatha / Nagashree. G
POPL	C-Programming Lab	3x3	Gangappa. D /Arshiya

KS

HOD

Dr. Swamy
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 081

PRINCIPAL



**TIMETABLE –FIRST SEMESTER – DECEMBER – 2022-23
PHYSICS CYCLE**

Dr. K. Sujatha

SUBJECT CODE: BPHYE102

BRANCH: EC

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON		←PHYL/C1	BREAK	PHYL C1-----→		LUNCH				
TUE	C	←PHYL A2		PHYL A2-----→						
WED				C			←-----PHYL/A3-----→			
THU		←PHYL/C2		PHYL C2-----→						
FRI		C					←-----PHYL/C3-----→			
SAT	C(T)						Proctor Meeting C1/C2/C3			

HOD
Dr. K. Sujatha

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

PRINCIPAL
Dr. Tippeswamy H N



CITY
ENGINEERING COLLEGE

**TIME TABLE –FIRST SEMESTER DECEMBER – 2022-23
PHYSICS CYCLE**

Mrs. Nagashree. G

SUBJECT CODE: BPHYS102

BRANCH: AIML&IS

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 - 12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON		A	BREAK		B	LUNCH	←-----PHYL/A1-----→		
TUE							←-----PHYL/ B1-----→		
WED	A	←PHYL/B2		PHYL/B2-----→					
THU		B			A		←----- PHYL/B3-----→		
FRI	B								
SAT		B(T)		A (T)	Proctor Meeting A1/A2/A3				

HOD
Dr. K. Sujatha

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 091

PRINCIPAL
Dr. Tippetwamy H N



CITY
ENGINEERING COLLEGE

TIMETABLE –FIRST SEMESTER – DECEMBER – 2022-23
PHYSICS CYCLE

Mr. Dinesh S

APPLIED PHYSICS LAB

BRANCH: AIML, IS&EC

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON		←PHYL C1	BREAK	PHYL C1-----→		LUNCH	←-----PHYL/A1-----→		
TUE		←PHYL A2		PHYL A2-----→			←-----PHYL/ B1-----→		
WED		←PHYL/B2		PHYL/B2-----→			←-----PHYL/A3-----→		
THU		←PHYL C2		PHYL C2-----→			←----- PHYL/B-----→		
FRI							←-----PHYL/C3-----→		
SAT									

HOD
Dr. K. Sujatha

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 081

PRINCIPAL
Dr. Tippetwamy H N

Course Title:	Applied Physics for CSE Stream		
Course Code:	BPHYS102/202	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours Theory + 10-12 Lab slots	Credits	04
Course objectives			
<ul style="list-style-type: none"> · To study the essentials of photonics and its application in computer science. · To study the principles of quantum mechanics and its application in quantum computing. · To study the electrical properties of materials · To study the essentials of physics for computational aspects like design and data analysis. 			
Teaching-Learning Process			
These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective			
<ol style="list-style-type: none"> 1. Flipped Class 2. Chalk and Talk 3. Blended Mode of Teaching and Learning 4. Simulations, Interactive Simulations and Animations 5. NPTEL and Other Videos for theory topics 6. Smart Class Room 7. Lab Experiment Videos 			
Module-1 (8 Hours)			
Laser and Optical Fibers:			
LASER: Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Einstein’s A and B Coefficients and Expression for Energy Density (Derivation), Laser Action, Population Inversion, Metastable State, Requisites of a laser system, Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling(Qualitative), Numerical Problems.			
Optical Fiber: Principle and Structure, Propagation of Light, Acceptance angle and Numerical Aperture (NA), Derivation of Expression for NA, Modes of Propagation, RI Profile, Classification of Optical Fibers, Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems			
Pre requisite: Properties of light			
Self-learning: Total Internal Reflection			
Module-2 (8 Hours)			
Quantum Mechanics:			
de Broglie Hypothesis and Matter Waves, de Broglie wavelength and derivation of expression by analogy, Phase Velocity and Group Velocity, Heisenberg’s Uncertainty Principle and its application (Non existence of electron inside the nucleus - Non Relativistic), Principle of Complementarity, Wave Function, Time independent Schrödinger wave equation (Derivation), Physical Significance of a wave function and Born Interpretation, Expectation value, Eigen functions and Eigen Values, Particle inside one dimensional infinite potential well, Quantization of Energy States, Waveforms and Probabilities. Numerical Problems.			
Pre requisite: Wave–Particle dualism			
Self-learning: de Broglie Hypothesis			
Module-3 (8 Hours)			
Quantum Computing:			
Principles of Quantum Information & Quantum Computing:			
Introduction to Quantum Computing, Moore’s law & its end, Differences between Classical & Quantum computing. Concept of qubit and its properties. Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits.			
Dirac representation and matrix operations:			
Matrix representation of 0 and 1 States, Identity Operator I, Applying I to $|0\rangle$ and $|1\rangle$ states, Pauli Matrices and its			

operations on $|0\rangle$ and $|1\rangle$ states, Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product), Probability, and Quantum Superposition, normalization rule. Orthogonality, Orthonormality. Numerical Problems

Quantum Gates:

Single Qubit Gates: Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate

Multiple Qubit Gates: Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of Swap gate, Controlled -Z gate, Toffoli gate.

Pre requisites: Matrices

Self-learning: Moore’s law

Module-4 (8 Hours)

Electrical Properties of Materials and Applications

Electrical Conductivity in metals

Resistivity and Mobility, Concept of Phonon, Matheissen’s rule, Failures of Classical Free Electron Theory, Assumptions of Quantum Free Electron Theory, Fermi Energy, Density of States, Fermi Factor, Variation of Fermi Factor With Temperature and Energy. Numerical Problems.

Superconductivity

Introduction to Super Conductors, Temperature dependence of resistivity, Meissner’s Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative), Quantum Tunnelling, High Temperature superconductivity, Josephson Junctions (Qualitative), DC and RF SQUIDS (Qualitative), Applications in Quantum Computing: Charge, Phase and Flux qubits, Numerical Problems.

Pre requisites: Basics of Electrical conductivity

Self-learning: Resistivity and Mobility

Module-5 (8 hours)

Applications of Physics in computing:

Physics of Animation:

Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale, Weight and Strength, Motion and Timing in Animations, Constant Force and Acceleration, The Odd rule, Odd-rule Scenarios, Motion Graphs, Examples of Character Animation: Jumping, Parts of Jump, Jump Magnification, Stop Time, Walking: Strides and Steps, Walk Timing. Numerical Problems

Statistical Physics for Computing: Descriptive statistics and inferential statistics, Poisson distribution and modeling the probability of proton decay, Normal Distributions (Bell Curves), Monte Carlo Method: Determination of Value of π . Numerical Problems.

Pre requisites: Motion in one dimension, Probability

Self-learning: Frames, Frames per Second

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

CO1	Describe the principles of LASERS and Optical fibers and their relevant applications.
CO2	Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.
CO3	Summarize the essential properties of superconductors and its applications in qubits.
CO4	Illustrate the application of physics in design and data analysis.
CO5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation(CIE):

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

CIE for the theory component of the IC

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15th week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

Semester End Examination(SEE):

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

Suggested Learning Resources:**Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)**

1. Solid State Physics, S O Pillai, New Age International Private Limited, 8th Edition, 2018.
2. Engineering Physics by Gupta and Gour, Dhanpat Rai Publications, 2016 (Reprint).
3. A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
4. Concepts of Modern Physics, Aurthur Beiser, McGrawhill, 6th Edition, 2009.
5. Lasers and Non Linear Optics, B B Loud, New age international, 2011 edition.
6. A Textbook of Engineering Physics by M.N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
7. Quantum Computation and Quantum Information, Michael A. Nielsen & Isaac L. Chuang, Cambridge Universities Press, 2010 Edition.

8. Quantum Computing, Vishal Sahani, McGraw Hill Education, 2007 Edition.
9. Quantum Computing – A Beginner’s Introduction, Parag K Lala, Indian Edition, Mc GrawHill, Reprint 2020.
10. Engineering Physics, S P Basavaraj, 2005 Edition, Subhash Stores.
11. Physics for Animators, Michele Bousquet with Alejandro Garcia, CRC Press, Taylor & Francis, 2016.
12. Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations, Maria Luisa Dalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli, Trends in Logic, Volume 48, Springer.
13. Statistical Physics: Berkely Physics Course, Volume 5, F. Reif, McGraw Hill.
14. Introduction to Superconductivity, Michael Tinkham, McGraw Hill, INC, II Edition

Web links and Video Lectures (e-Resources):

LASER: <https://www.youtube.com/watch?v=WgzynecPiyc>

Superconductivity : <https://www.youtube.com/watch?v=MT5Xl5ppn48>

Optical Fiber : https://www.youtube.com/watch?v=N_kA8EpCUQo

Quantum Mechanics : <https://www.youtube.com/watch?v=p7bzE1E5PMY&t=136s>

Quantum Computing : <https://www.youtube.com/watch?v=jHoEjvuPoB8>

Quantum Computing : <https://www.youtube.com/watch?v=ZuvCUU2jD30>

Physics of Animation : https://www.youtube.com/watch?v=kj1kaA_8Fu4

Statistical Physics Simulation : https://phet.colorado.edu/sims/html/plinko-probability/latest/plinko-probability_en.html

NPTEL Superconductivity: <https://archive.nptel.ac.in/courses/115/103/115103108/>

NPTEL Quantum Computing : <https://archive.nptel.ac.in/courses/115/101/115101092>

Virtual LAB : <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>

Virtual LAB : <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

<http://nptel.ac.in> <https://swayam.gov.in>

https://virtuallabs.merlot.org/vl_physics.html

<https://phet.colorado.edu>

<https://www.myphysicslab.com>

Laboratory Component:

Any Ten Experiments have to be completed from the list of experiments

Note: The experiments have to be classified into

- a) Exercise
- b) Demonstration
- c) Structured Inquiry
- d) Open Ended

Based on the convenience classify the following experiments into above categories. Select at least one simulation/spreadsheet activity.

List of Experiments

1. Determination of wavelength of LASER using Diffraction Grating.
2. Determination of acceptance angle and numerical aperture of the given Optical Fiber.
3. Determination of Magnetic Flux Density at any point along the axis of a circular coil.
4. Determination of resistivity of a semiconductor by Four Probe Method
5. Study the I-V Characteristics of the Given Bipolar Junction Transistor.
6. Determination of dielectric constant of the material of capacitor by Charging and Discharging method.
7. Study the Characteristics of a Photo-Diode and to determine the power responsivity / Verification of Inverse Square Law of Intensity of Light.
8. Study the frequency response of Series & Parallel LCR circuits.
9. Determination of Planck's Constant using LEDs.
10. Determination of Fermi Energy of Copper.
11. Identification of circuit elements in a Black Box and determination of values of the components.
12. Determination of Energy gap of the given Semiconductor.
13. Step Interactive Physical Simulations.
14. Study of motion using spread Sheets
15. Study of Application of Statistics using spread sheets
16. PHET Interactive Simulations(<https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html.prototype>)

COs and POs Mapping (Individual teacher has to fill up)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	2	-	-	-	-	-	-	-	-	-	2
CO2	3	3	-	-	-	-	-	-	-	-	-	2
CO3	3	3	-	-	-	-	-	-	-	-	-	2
CO4	3	2	1	-	1	-	-	-	-	-	-	2
CO5	3	2	1	-	2	-	-	3	3	-	-	2

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped,

Note : The CO-PO mapping values are indicative. The course coordinator can alter the mapping using **Competency and Performance Indicators** mentioned in the **AICTE Exam reforms**.



DEPARTMENT OF PHYSICS

LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2022 - 2023

Course Title: Applied Physics for CSE stream	Course Code : BPHYS102
Total contact hours: L:T:P:S :: 2:2:2:0	Course Type : Integrated
CIE Marks : 50 SEE Marks :50	Total Marks : 100
Semester: I	Academic year : 2022-2023
Lesson plan Author: Dr. K Sujatha, Nagasree G, Dinesh S	Date :14/12/2022

Course Objective:

- To study the essentials of photonics and its application in computer science.
- To study the principles of quantum mechanics and its application in quantum computing.
- To study the electrical properties of materials
- To study the essentials of physics for computational aspects like design and data analysis.

Course Outcomes:

After studying this course, students will be able to:

CO1- Describe the principles of LASERS and Optical fibers and their relevant applications.

CO2 -Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.

CO3- Summarize the essential properties of superconductors and its applications in qubits.

CO4- Illustrate the application of physics in design and data analysis.

CO5- Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

MODULE-1

Week	Days/ Date	Contents of Module Lasers and Optical Fibers	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Einstein's A and B	R,U	CO1
	2	Coefficients and Expression for Energy Density (Derivation), Laser Action,	R,U	CO1
	3	Population Inversion, Metastable State, Requisites of a laser system,	R,U	CO1
	4	Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling(Qualitative), Numerical Problems	R,U,E,C	CO1
2	1	Principle and Structure, Propagation of Light,	R,U	CO1
	2	Acceptance angle and Numerical Aperture (NA),	R,U	CO1
	3	Derivation of Expression for NA, Modes of Propagation, RI Profile, Classification of Optical Fibers,	R,U	CO1
	4	Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems	R,U	CO1

MODULE-2

Week	Days/ Date	Contents of Module Quantum Mechanics	Bloom's Taxonomy Level	Course Outcome (CO)
3	1	de Broglie Hypothesis and Matter Waves, de Broglie wavelength	R,U	CO2
	2	derivation of expression by analogy, Phase Velocity and Group Velocity	R,U	CO2
	3	Heisenberg's Uncertainty Principle and its application (Non existence of electron inside the nucleus - Non Relativistic),	R,U	CO2
	4	Principle of Complementarity, Wave Function, Time independent Schrödinger wave equation (Derivation)	R,U	CO2
4	1	Physical Significance of a wave function and Born Interpretation	R,U	CO2
	2	Expectation value, Eigen functions and Eigen Values,	R,U	CO2
	3	Particle inside one dimensional infinite potential well,	R,U	CO2
	4	Quantization of Energy States, Waveforms and Probabilities. Numerical Problems	R,U	CO2

MODULE-3

Week	Days/ Date	Contents of Module Quantum Computing	Bloom's Taxonomy Level	Course Outcome (CO)
5	1	Introduction to Quantum Computing, Moore's law & its end	R,U	CO2
	2	Differences between Classical & Quantum computing. Concept of qubit and its properties.	R,U	CO2
	3	Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits.	R,U,E	CO2
	4	Matrix representation of 0 and 1 States, Identity Operator I, Applying I to $|0\rangle$ and $|1\rangle$ states, Pauli Matrices and its operations on $|0\rangle$ and $|1\rangle$ states,	R,U	CO2
6	1	Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product),	R,U	CO2
	2	Probability, and Quantum Superposition, normalization rule. Orthogonality, Orthonormality. Numerical Problems	R,U	CO2
	3	Single Qubit Gates: Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate	R,U	CO2
	4	Multiple Qubit Gates: Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of Swap gate, Controlled -Z gate, Toffoli gate.	R,U	CO2

MODULE-4

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
7	1	Resistivity and Mobility, Concept of Phonon, Matheissen's rule,	R,U,	CO3
	2	Failures of Classical Free Electron Theory	R,U	CO3
	3	Assumptions of Quantum Free Electron Theory, Fermi Energy, Density of States,	R,U	CO3
	4	Fermi Factor, Variation of Fermi Factor With Temperature and Energy. Numerical Problems	R,U	CO3
8	1	Introduction to Super Conductors, Temperature dependence of resistivity	R,U	CO3
	2	Meissner's Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative)	R,U	CO3
	3	Quantum Tunnelling, High Temperature superconductivity, Josephson Junctions (Qualitative), DC and RF SQUIDS (Qualitative),	R,U	CO3
	4	Applications in Quantum Computing: Charge, Phase and Flux qubits, Numerical Problems.	R,U	CO3

MODULE-5

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
9	1	Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale	R,U,A2	CO4
	2	Weight and Strength, Motion and Timing in Animations, Constant Force and Acceleration,	R,U	CO4
	3	The Odd rule, Odd-rule Scenarios, Motion Graphs, Examples of Character Animation:	R,U	CO4
	4	Jumping, Parts of Jump, Jump Magnification, Stop Time, Walking: Strides and Steps, Walk Timing	R,U	CO4
10	1	Numerical Problems	R,U,E	CO4
	2	Descriptive statistics and inferential statistics, Poisson distribution and modeling the probability of proton decay,	R,U	CO4
	3	Normal Distributions (Bell Curves), Monte Carlo Method: Determination of Value of π .	R,U	CO4
	4	Numerical Problems	R,U	CO4

**Bloom's Taxonomy Level :R-Remembering U-Understanding A1-Applying
A2-Analysing
E-evaluating C-Creating**

Suggested Learning Resources:

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1. Solid State Physics, S O Pillai, New Age International Private Limited, 8th Edition, 2018.
2. Engineering Physics by Gupta and Gour, Dhanpat Rai Publications, 2016 (Reprint).
3. A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
4. A Textbook of Engineering Physics by M.N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
5. Quantum Computation and Quantum Information, Michael A. Nielsen & Isaac L. Chuang, Cambridge Universities Press, 2010 Edition. 26.10.2022 4
6. Quantum Computing, Vishal Sahani, McGraw Hill Education, 2007 Edition.
- 7 Quantum Computing – A Beginner's Introduction, Parag K Lala, Indian Edition, Mc GrawHill, Reprint 2020.
8. Engineering Physics, S P Basavaraj, 2005 Edition, Subhash Stores.
9. Physics for Animators, Michele Bousquet with Alejandro Garcia, CRC Press, Taylor & Francis, 2016.
10. Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations, Maria Luisa Dalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli, Trends in Logic, Volume 48, Springer.

Web links and Video Lectures (e-Resources):

- LASER: <https://www.youtube.com/watch?v=WgzynzPiyC>
Superconductivity : <https://www.youtube.com/watch?v=MT5Xl5ppn48>
Optical Fiber : https://www.youtube.com/watch?v=N_kA8EpCUQo
Quantum Mechanics : <https://www.youtube.com/watch?v=p7bzE1E5PMY&t=136s>
Quantum Computing : <https://www.youtube.com/watch?v=jHoEjvuPoB8>
Physics of Animation : https://www.youtube.com/watch?v=kj1kaA_8Fu4
Statistical Physics Simulation : https://phet.colorado.edu/sims/html/plinko-probability/latest/plinkoprobability_en.html
NPTEL Quantum Computing : <https://archive.nptel.ac.in/courses/115/101/115101092>
Virtual LAB : <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>
Virtual LAB : <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- <http://nptel.ac.in>
<https://swayam.gov.in>
https://virtuallabs.merlot.org/vl_physics.html
<https://phet.colorado.edu>
<https://www.myphysicslab.com>



Staff

Department of Physics



HOD

Department of Physics



Question Bank

Course Name: Applied Physics for CSE Stream

Course Code: BPHYS102

Semester: I

Section: A, B & C

Module-I

Laser and Optical Fibers:

1. Explain the three possible ways through which radiation interacts with matter.
2. Derive the expression for energy density by using Einstein's coefficients.
3. Explain the requisites and conditions to obtain a laser beam.
4. Explain the construction and working of semiconductor laser with energy level diagram.
5. Explain the applications of lasers in
 - a) Bar code
 - b) Laser printer
 - c) Laser cooling
6. What is Numerical Aperture? Derive the expression for Numerical Aperture with a neat diagram.
7. With neat diagrams explain the different types of optical fibers.
8. What is attenuation. Explain the different types of attenuation mechanisms with neat diagrams.
9. Write a note on applications of optical fibers in
 - a) Fiber optic networking
 - b) Point to point communication
10. Mention the advantages and disadvantages of optical fibers in point-to-point communication.



Module-II

Quantum Mechanics:

1. Explain De-Broglie hypothesis and derive the expression for de Broglie wavelength and what are the characteristics of matter waves.
2. Define phase velocity and group velocity and mention the expression for the same.
3. State and explain Heisenberg's uncertainty principle and its physical significance.
4. Using uncertainty principle prove that free electron cannot exist inside the nucleus.
5. What is a wave function and what are the properties of wave function.
6. Explain a) Max-Born interpretation b) Normalization.
7. Derive the expression for time independent Schrodinger wave equation in one dimension.
8. Using the time independent Schrodinger wave equation obtain the solution for normalized wave function.
9. Find eigenvalues and eigen functions for a particle in one dimensional potential well.
10. Discuss the wave function probability densities and eigen energy values for a free particle in a box by considering the ground state and first two excited states.



Module-III

Quantum Computing

1. State and explain Moore's law.
2. Compare classical and quantum information.
3. Mention the differences between classical and quantum computing.
4. What is qubit? Mention the properties of qubits.
5. What is Bloch sphere? Represent the single qubit states $|0\rangle$ and $|1\rangle$ on the Bloch sphere.
6. Discuss matrix form of single qubit, two qubit states and n-qubits.
7. Compose identity operator? Show that identity operator operates on the states $|0\rangle$ and $|1\rangle$ leaves the same states.
8. Mention the Pauli matrices. Discuss the Pauli matrices operation on $|0\rangle$ and $|1\rangle$ states.
9. Explain conjugate and transpose of matrix.
10. What are unitary, row and column matrix? What is the condition for matrix multiplication or inner product? Give one example.
11. What is unitary operator? Show that $U^\dagger U = U U^\dagger = I$ using the matrix $A = \begin{bmatrix} \cos\theta & i\sin\theta \\ i\sin\theta & \cos\theta \end{bmatrix}$.
12. Explain probability, normalisation, quantum superposition, orthogonality and orthonormality.
13. Explain single qubit quantum NOT gate.
14. Mention unitary operator for Pauli X, Y, Z, and Hadamard quantum gates using tensor product or outer product. Explain the operations of Pauli X, Y, Z, and Hadamard quantum gates on $|0\rangle$ and $|1\rangle$ states. And represent the input and output states on the Bloch sphere.
15. Obtain unitary operator for S (Swap) gate using rotation unitary operator $RZ(\varphi) = e^{-i\varphi/2} \cdot \sigma_Z$. Show that $T = \sqrt{S}$.
16. What are two qubit quantum logic gates? Discuss two qubit quantum NOT gate or controlled NOT gate with four different input states.
17. Discuss two qubit quantum S gate or controlled S gate with four different input states.
18. Discuss two qubit quantum Z gate or controlled Z gate with four different input states.
19. What are three qubit quantum logic gates?
20. Discuss Toffoli or controlled controlled NOT or C2NOT gate with all different 8 (eight) input states.



CITY
ENGINEERING COLLEGE

Module-IV

Electrical Properties of Materials and Applications:

1. Explain in brief classical free electron theory of metals.
2. Explain the effect of temperature and impurity on electrical resistivity of metals. (Matheissen's rule)
3. Explain the failures of classical free electron theory. What are the assumptions of quantum free electron theory.
4. Explain fermi factor and variation of fermi factor with temperature with suitable graph.
5. Explain the temperature dependence of resistivity of metals and superconductors.
6. Explain BCS theory of superconductivity and formation of cooper pairs.
7. Explain Meissner's effect with suitable diagram.
8. Explain critical field and temperature dependence of critical field.
9. Explain the different types of superconductors by giving examples of each with suitable graphs.
10. Write a note on high temperature superconductors.
11. Explain quantum tunneling, Josephson junction and its types.
12. What is a SQUID. Explain DC and RF SQUIDS using diagrams.
13. Explain flux quantization with suitable diagram.
14. What are Qubits and explain flux, charge and phase Qubits.



Module-V

Physics of Animation

1. What is animation. Explain frame and frame per second.
2. Explain a) size and scale b) proportion & scale c) weight and strength.
3. Explain motion and timing in animations
(Linear motion, uniform motion, slow in & slow out)
4. Elucidate constant force and acceleration.
5. Explain the odd rule, odd rule multiplier and odd rule scenarios with examples.
6. Give a brief discussion about motion graphs.
7. Explain jumping and ports of jump in detail.
8. Explain jump magnification and acceleration.
9. Explain the calculation of push time stop time with examples.
10. Elucidate walking and explain strides and steps with neat diagram.
11. Distinguish between descriptive and inferential statistics.
12. Discuss the salient features of normal distribution using bell curves.
13. Mention the general pattern of monte Carlo method and hence determine the value of π .
14. Discuss modelling the probability for proton decay.
15. Explain Poisson distribution & mass function.

Staff

Mrs. Nagasree G
Department of Physics

HOD

Dr. Sujatha
Department of Physics



CITY
ENGINEERING COLLEGE

Assignment Questions

Odd Semester 22-23

Course Name: Applied Physics for CSE Stream

Course Code: BPHYS102

Semester: I

Section: A, B & C

Module-I

Laser and Optical Fibers:

1. Derive the expression for energy density by using Einstein's coefficients.
2. Explain the requisites and conditions to obtain a laser beam.
3. Explain the construction and working of semiconductor laser with energy level diagram.
4. Explain the applications of lasers in
 - a) Bar code
 - b) Laser printer
 - c) Laser cooling
5. What is Numerical Aperture? Derive the expression for Numerical Aperture with a neat diagram.
6. With neat diagrams explain the different types of optical fibers.
7. What is attenuation. Explain the different types of attenuation mechanisms with neat diagrams.
8. Write a note on applications of optical fibers in
 - a) Fiber optic networking
 - b) Point to point communication



CITY
ENGINEERING COLLEGE

Module-II

Quantum Mechanics:

1. Explain De-Broglie hypothesis and derive the expression for de Broglie wavelength and what are the characteristics of matter waves.
2. State and explain Heisenberg's uncertainty principle and its physical significance.
3. Using uncertainty principle prove that free electron cannot exist inside the nucleus.
4. Explain a) Max-Born interpretation b) Normalization.
5. Derive the expression for time independent Schrodinger wave equation in one dimension.
6. Using the time independent Schrodinger wave equation obtain the solution for normalized wave function.
7. Find eigenvalues and eigen functions for a particle in one dimensional potential well.
8. Discuss the wave function probability densities and eigen energy values for a free particle in a box by considering the ground state and first two excited states.



Module-III

Quantum Computing

1. State and explain Moore's law.
2. Compare classical and quantum information.
3. Mention the differences between classical and quantum computing.
4. What is qubit? Mention the properties of qubits.
5. What is Bloch sphere? Represent the single qubit states $|0\rangle$ and $|1\rangle$ on the Bloch sphere.
6. Discuss matrix form of single qubit, two qubit states and n-qubits.
7. Compose identity operator? Show that identity operator operates on the states $|0\rangle$ and $|1\rangle$ leaves the same states.
8. Mention the Pauli matrices. Discuss the Pauli matrices operation on $|0\rangle$ and $|1\rangle$ states.
9. Explain conjugate and transpose of matrix.
10. What are unitary, row and column matrix? What is the condition for matrix multiplication or inner product? Give one example.
11. What is unitary operator? Show that $U^\dagger U = U U^\dagger = I$ using the matrix $A = \begin{bmatrix} \cos\theta & \\ i\sin\theta & \\ & i\sin\theta & \\ & & \cos\theta \end{bmatrix}$.
12. Explain probability, normalisation, quantum superposition, orthogonality and orthonormality.
13. Explain single qubit quantum NOT gate.
14. Mention unitary operator for Pauli X, Y, Z, and Hadamard quantum gates using tensor product or outer product. Explain the operations of Pauli X, Y, Z, and Hadamard quantum gates on $|0\rangle$ and $|1\rangle$ states. And represent the input and output states on the Bloch sphere.
15. Obtain unitary operator for S (Swap) gate using rotation unitary operator $RZ(\varphi) = e^{-i\varphi/2} \cdot \sigma_Z$. Show that $T = \sqrt{S}$.
16. What are two qubit quantum logic gates? Discuss two qubit quantum NOT gate or controlled NOT gate with four different input states.
17. Discuss two qubit quantum S gate or controlled S gate with four different input states.
18. Discuss two qubit quantum Z gate or controlled Z gate with four different input states.



CITY
ENGINEERING COLLEGE

Module-IV

Electrical Properties of Materials and Applications:

1. Explain the failures of classical free electron theory. What are the assumptions of quantum free electron theory.
2. Explain fermi factor and variation of fermi factor with temperature with suitable graph.
3. Explain the temperature dependence of resistivity of metals and superconductors.
4. Explain BCS theory of superconductivity and formation of cooper pairs.
5. Explain Meissner's effect with suitable diagram.
6. Explain critical field and temperature dependence of critical field.
7. Explain the different types of superconductors by giving examples of each with suitable graphs.
8. Write a note on high temperature superconductors.
9. Explain quantum tunneling, Josephson junction and its types.
10. What is a SQUID. Explain DC and RF SQUIDS using diagrams.
11. Explain flux quantization with suitable diagram.
12. What are Qubits and explain flux, charge and phase Qubits.



CITY
ENGINEERING COLLEGE

Module-V

Physics of Animation

1. What is animation. Explain frame and frame per second.
2. Explain a) size and scale b) proportion & scale c) weight and strength.
3. Explain motion and timing in animations
(Linear motion, uniform motion, slow in & slow out)
4. Elucidate constant force and acceleration.
5. Explain the odd rule, odd rule multiplier and odd rule scenarios with examples.
6. Give a brief discussion about motion graphs.
7. Explain jumping and parts of jump in detail.
8. Explain jump magnification and acceleration.
9. Explain the calculation of push time stop time with examples.
10. Elucidate walking and explain strides and steps with neat diagram.
11. Distinguish between descriptive and inferential statistics.
12. Discuss the salient features of normal distribution using bell curves.
13. Mention the general pattern of monte Carlo method and hence determine the value of π .

A handwritten signature in black ink, appearing to read 'Gang' with a long horizontal stroke extending to the right.

Staff

Mrs. Nagasree G
Department of Physics

A handwritten signature in black ink, appearing to read 'Sujatha' with a long horizontal stroke extending to the right.

HOD

Dr. Sujatha
Department of Physics

USN

1	C	E							
---	---	---	--	--	--	--	--	--	--

V/S

CITY ENGINEERING COLLEGE
I Internal Test

Course:- Physics for CSE stream, 22PHYS12
Programme:- AIML & IS
Sem & Sec:- Ist, A & B

Date:- 02/02/2023
Time:- 10.30AM-12.00 PM
Max.Marks-40

Q.No.	ANSWER ALL QUESTIONS	MAR KS	CO' S	BT Lev -el
-------	----------------------	-----------	----------	------------------

PART-A

1.	Derive the expression for energy density by using Einstein's coefficients.	10	CO1	BT2
----	--	----	-----	-----

OR

2.a)	Explain the application of lasers in Laser Printer with a suitable diagram .	5	CO1	BT3
b)	The average output power of laser source emitting a laser beam of wavelength 6328 \AA is 5 mW. Find the number of photons emitted per second by the laser source.	5	CO1	BT5

PART-B

3.	Derive the expression for Numerical Aperture with neat diagram and explanation.	10	CO1	BT2
----	---	----	-----	-----

OR

4.a)	Explain the construction and working principle of optical fibers.	5	CO1	BT2
b)	An optical fiber has a core material with refractive index 1.55 and its cladding has a refractive index of 1.50. The light is launched into it in air, Calculate its numerical aperture, the acceptance angle and also the fractional index change.	5	CO1	BT5

PART-C

5.	Explain Heisenberg's Uncertainty Principle and prove that electrons cannot exist inside the nucleus.	10	CO2	BT3
----	--	----	-----	-----

OR

6.a)	Explain de-Broglie hypothesis and derive the expression for de-Broglie wavelength .	5	CO2	BT2
b)	Define group velocity and phase velocity and mention the expression.	5	CO2	BT1

PART-D

7.a)	Explain the different types of optical fibers.	6	CO1	BT2
b)	Find the attenuation in an optical fiber of length 500m, when a light signal of power 100mW emerges out of the fiber with a power 90 mW.	4	CO1	BT5

OR

8.	Explain the construction and working of Semiconductor Laser.	10	CO1	BT2
----	--	----	-----	-----

Course outcomes:-

CO1--- Describe the principles of Lasers and Optical Fibers and their relevant applications.

CO2— Discuss the basic principles of the Quantum mechanics and its applications in Quantum Computing .

BT1—Knowledge BT2---Understand BT3---Apply BT5----Evaluate.

CITY ENGINEERING COLLEGE
DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION

Internal Test I

Semester & Section: Ist, A&B

Date: 02/02/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
①	<p style="text-align: center;"><u>Part-A</u></p> <p>Explanation of all three cases</p> <p>active upto $B_{12}N_1U_A = A_{21}N_2 + B_{21}N_1U_A$</p> <p>and $U_A = \frac{A}{B(e^{\frac{hf}{kT}} - 1)}$, $B_{12} = B_{21}$</p> <p style="text-align: center;">(OR)</p>	<p>3M</p> <p>2M</p> <p>5M</p>	10M
② a	<p>diagram and explanation</p> <p>Construction and working</p>	<p>2M</p> <p>3M</p>	5M
② b	<p>Data - $\lambda = 6328 \text{ \AA} = 6328 \times 10^{-10} \text{ m}$</p> <p>$P_{\text{out}} = 5 \text{ mW} = 5 \times 10^{-3} \text{ W}$</p> <p>$N = ?$</p> <p>W.K.T. $\Delta E = \frac{hc}{\lambda}$ $N \times \Delta E = P_{\text{out}}$</p> <p>$\Delta E = 3.143 \times 10^{-19} \text{ J}$</p> <p>$N = 1.59 \times 10^{16}$</p> <p>the number of photons emitted Per second = 1.59×10^{16}</p>	<p>1M</p> <p>2M</p> <p>2M</p>	5M

GS
Staff

PS
HOD

CITY ENGINEERING COLLEGE
 DEPARTMENT OF Physics
 SCHEME FOR VALUATION
 Internal Test I

Semester & Section: Ist, A & B

Date: 02/02/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
	<u>Part-B</u>		
③	Diagram and explanation arrive upto $\sin \theta_0 = \sqrt{n_1^2 - n_2^2}$	3M	10M
	$N.A = \sqrt{n_1^2 - n_2^2}$	2M	
	and $\sin \theta_c < N.A$	2M	
	(cos)		
④ (a)	Construction diagram and explanation	2M	5M
	Explanation of total internal reflection with suitable figure	2M	
	arrive upto $\theta_c = \sin^{-1} \left(\frac{n_2}{n_1} \right)$	1M	
⑥	Given data - $n_1 = 1.55, n_2 = 1.50$ $n_0 = 1$ Find - $N.A = ?$, $\theta_0 = ?$, $\Delta = ?$	1M	5M
	W.K.T $N.A = \sqrt{n_1^2 - n_2^2} = 0.39$	2M	
	$\theta = \sin^{-1} (N.A) = 23^\circ$	2M	
	$\Delta = (n_1 - n_2) / n_1 = 0.032$		

GA
Staff

WJ
HOD

CITY ENGINEERING COLLEGE
DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: Ist, A XB

Date: 02/04/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
⑤	<p style="text-align: center;"><u>Part - C</u></p> <p>Statement of HUP Explanation and expressions W.K.T $E = \frac{p^2}{2m}$ $\Delta x \leq 10^{-14} \text{ m}$ assume up to $E \geq 85 \text{ MeV}$.</p>	<p>2M 3M 2M 3M</p>	<p>10M</p>
⑥ (a)	<p>(09) de Broglie hypothesis explanation and assume up to $\lambda = \frac{h}{p}$.</p>	<p>2M 3M</p>	<p>5M</p>
⑥ (b)	<p>group velocity, phase velocity definitions with expressions.</p>	<p>2M 2M 1M</p>	<p>5M</p>

Col
Staff

by
HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: 1st, A & B

Date: 02/02/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
<p>④ (a)</p>	<p style="text-align: center;"><u>Part - D</u></p> <p>Explanation of three types of optical fibers with suitable graphs and its applications:</p>	<p>2M 2M 2M</p>	<p>6M</p>
<p>⑤</p>	<p>Given data - $L = 500 \text{ m} = 0.5 \text{ km}$ $P_{in} = 100 \text{ mW} = 100 \times 10^{-3} \text{ W}$ $P_{out} = 90 \text{ mW} = 90 \times 10^{-3} \text{ W}$ Find - $\alpha = ?$</p> <p>W.K.T. $\alpha = \frac{-10}{L} \log_{10} \left(\frac{P_{out}}{P_{in}} \right) \text{ dB/km}$ $= 0.915 \text{ dB/km}$</p> <p>(2)</p>	<p>1M 1M 2M</p>	<p>4M</p>
<p>⑥</p>	<p>Diagram and explanation Construction and working energy level diagram Applications</p>	<p>2M 2M 2M 4M</p>	<p>10M</p>

Staff

HOB

USN

1	C	E							
---	---	---	--	--	--	--	--	--	--

V8

CITY ENGINEERING COLLEGE

IInd Internal Test

Course: - Physics for CSE stream, BPHYS102
 Program: - AIML & IS
 Sem & Sec:- Ist, A & B

Date: - 02/03/2023
 Time: -10.30AM-12.00 PM
 Max.Marks-40

Q.No.	ANSWER ALL QUESTIONS	MARKS	CO'S	BT Level
PART-A				
1.	Derive Eigen energy values and Eigen functions for a particle in an infinite potential well.	10	CO2	BT3
OR				
2.a)	What is wavefunction. What are the properties of wavefunction.	6	CO2	BT2
b)	The ground state energy of an electron in an one dimensional infinite potential well of width 2 \AA is 16 eV . Find its third excited state energy. <i>256 eV</i>	4	CO2	BT5
PART-B				
3.	Explain Fermi energy. Explain Fermi factor and variation of Fermi factor with temperature with suitable graph.	10	CO3	BT2
OR				
4.a)	Explain Meissner's effect with suitable diagram.	6	CO3	BT2
b)	Calculate the probability of an electron occupying an energy level 0.02 eV above the Fermi level at 200 K and 400 K in a material. <i>0.24</i> <i>0.36</i>	4	CO3	BT5
PART-C				
5.	Explain different types of superconductors with graphs and examples. Write a short note on high temperature superconductors.	10	CO3	BT2
OR				
6.a)	What is a SQUID. Explain DC squids and RF squids with using diagrams.	6	CO3	BT2
b)	Lead has Superconducting transition temperature of 7.26 K . If initial field at 0 K is $50 \times 10^3 \text{ A/m}$, calculate the critical field at 6 K . <i>18.834 \times 10^3 \text{ A/m}</i>	4	CO3	BT5
PART-D				
7.	What are Qubits and Explain Charge Qubit, Flux Qubit and Phase Qubits using diagrams.	10	CO3	BT3
OR				
8.	Derive the expression for Time Independent Schrodinger wave equation in one dimension. Mention the expression for three dimensions.	10	CO3	BT2

Course outcomes: -

CO2--- Discuss the basic principles of quantum mechanics and its applications in quantum computing.

CO3--- Summarize the essential properties of superconductors and its applications in qubits.

BT1—Knowledge BT2---Understand BT3---Apply BT4---- Analyzing BT5----Evaluate.

CITY ENGINEERING COLLEGE
 DEPARTMENT OF Physics
 SCHEME FOR VALUATION
 Internal Test II

Semester & Section: Ist / A, B Sections

Date: 02/03/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
①	Diagrams and explanation	2M	10M
	wave function $\psi_n = \sqrt{\frac{2}{a}} \sin\left(\frac{n\pi}{a}\right)x$	4M	
	and Eigen energy $E_n = \frac{n^2 h^2}{8ma^2}$	4M	
②a	wavefunction definition	2M	6M
	properties of wave function	4M	
③	Given $E_0 = 16 \text{ eV}$		4M
	To find $E_4 = ?$		
	W.K.T $E_n = \frac{n^2 h^2}{8ma^2}$	2M	
	$E_n = n^2 E_0$ $E_4 = 256 \text{ eV}$	2M	

Staff

100

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test U

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
	<u>Part-B</u>		
(3)	Fermi energy explanation with diagram Fermi factor - Three cases Graph and their explanation.	2M 3x2M=6M 2M	10M
(4) (a)	Meissner effect explanation with suitable graph.	4M 2M	6M
(b)	Given $E - E_F = 0.02 \text{ eV}$ Find $f(E)$ at $200\text{K} = ?$ $f(E)$ at $400\text{K} = ?$ W.K.T $f(E) = \frac{1}{e^{\frac{E - E_F}{kT}} + 1}$ at 200K , $f(E) = 0.24$ 1 400K , $f(E) = 0.36$	2M 1M 1M	4M

~~GA~~
Staff

~~NS~~
MOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test II

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
	<u>Part-C</u>		
5	Explanation of two types of superconductors with suitable graphs short notes on High temperature superconductors	2x3=6M 2M 2M	10M
6a	SQUID - explanation DC SQUID - Diagram & explanation RF SQUID - Diagram & explanation	2M 2M 2M	6M
b	Given - $T_c = 7.26 K$ $T = 6 K$ $H_0 = 50 \times 10^3 A/m$ $H_c = ?$ w.k.T $H_c = H_0 \left(1 - \left(\frac{T}{T_c}\right)^2\right) = 15.834 \times 10^3 A/m$	1M (2+1)M	4M

Staff

100

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test II

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
7	<p style="text-align: center;"><u>Post-D</u></p> <p>Qubits explanation</p> <p>Explanation of charge qubit flux qubit phase qubit with suitable diagrams</p>	<p>2M 2M 2M 2M 2M</p>	<p>10M</p>
8	<p style="text-align: center;">(08)</p> <p>wave, up to $\psi = Ae^{i(kx - \omega t)}$</p> <p>$\lambda = \frac{h}{p}$</p> <p>$\frac{d^2\psi}{dx^2} = -\frac{1}{\lambda^2} \frac{d^2\psi}{dx^2}$</p> <p>$k \cdot E = \frac{h^2}{8\pi^2 m^2} \frac{d^2\psi}{dx^2}$</p> <p>$p \cdot E = V$</p> <p>wave up to $\frac{d^2\psi}{dx^2} + \frac{8\pi^2 m^2}{h^2} (E - V)\psi = 0$</p> <p>$\nabla^2 \psi + \frac{8\pi^2 m^2}{h^2} (E - V)\psi = 0$</p>	<p>1M 1M 4M 3M 1M</p>	<p>10M</p>

Staff

800

USN

1 C E

CITY ENGINEERING COLLEGE

IIIrd Internal Test

128

Course:- Physics for CSE stream, BPHYS102

Date:- 05/04/2023

Programme:- AIML & IS

Time:-10.30AM-12.00 PM

Sem & Sec:- Ist, A & B

Max.Marks-40

Q.No.	ANSWER ALL QUESTIONS	MARKS	CO'S	BT Level
PART-A				
1.a)	State and Explain Moore's law.	6	CO2	BT2
b)	Show that S gate can be formed by connecting two T gates in series.	4	CO2	BT5
OR				
2.a)	What is Animation. Explain Size and Scale, Weight and Strength.	6	CO4	BT2
b)	While animating a speeding up car the total distance travelled over 6 frames is 25m. Calculate the base distance.	4	CO4	BT5
PART-B				
3.a)	What is Qubit? Mention the properties of Qubits.	4	CO2	BT2
b)	What is Bloch Sphere? Represent single Qubit states $|0\rangle, |1\rangle$ on Bloch Sphere.	6	CO2	BT3
OR				
4.a)	Explain the calculation of Push time and Stop time with examples	6	CO4	BT2
b)	The jump animation is associated with a Push Time of 5 frames, Push Height 0.4m and Stop Height 0.5m. Calculate the Stop time. Express the Push Time and Stop time in sec if the animation is played at 30 fps.	4	CO4	BT5
PART-C				
5. a)	Explain Conjugate, Transpose and Unitary of a matrix.	6	CO2	BT2
b)	Given $A = \begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix}$, Prove that $A^\dagger = A$	4	CO2	BT5
OR				
6.a)	Distinguish between descriptive and inferential statistics.	6	CO4	BT2
b)	The number of particles emitted per sec by a random radioactive source has a poisson distribution with $\lambda=4$. Calculate the probability of $P(X=0), P(X=1)$ and $P(X=2)$	4	CO4	BT5
PART-D				
7.	What are two Qubit Quantum logic gates? Discuss two qubit quantum NOT gate or controlled NOT gate with four different input states.	10	CO2	BT4
OR				
8.	Discuss the salient features of Normal distribution using Bell Curves.	10	CO2	BT2

Course outcomes:-

CO2--- Discuss the basic principles of quantum mechanics and its applications in quantum computing.

CO4--- Illustrate the applications of Physics in design and data analysis.

BT1---Knowledge BT2---Understand BT3---Apply BT4--- Analyzing BT5---Evaluate.

CITY ENGINEERING COLLEGE
DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION

Internal Test III

Semester & Section: I, A & B

Date: 05/04/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
① @	<u>Part-A</u>		
	Mooze's law statement	2M	6M
	Explanation	2M	
Graph	2M		
⑥	To prove $T^2 = S$ where $T = \begin{bmatrix} 1 & 0 \\ 0 & \frac{1}{e^4} \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & \frac{1}{e^4} \end{bmatrix}$	1M 3M	4M
② @	Animation explanation	2M	6M
	Size and scale explanation	2M	
	weight & strength explanation	2M	
⑥	w-k-t Base distance = $\frac{\text{Total distance}}{(last\ frame\ distance - 1)^2}$ Given total distance = 25 m frames = 6 Base distance = $\frac{25}{(6-1)^2} = \frac{25}{10} = 2.5\ m$	1M 1M 2M	4M

Staff

HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test III

Semester & Section: 2nd, A/B sections

Date: 05/04/23

Question No.	Details of the answer	Marks Distribution	Total Marks
(3) (a)	<u>Part-B</u> Qubit explanation properties of qubits	2M 2M	4M
(b)	Block sphere explanation diagram & explanation up to $|\cos \frac{\theta}{2}|^2 + |\sin \frac{\theta}{2}|^2 = 1$ (09)	2M 2M 2M	6M
(4) (a)	push time explanation stop time explanation	3M 3M	6M
(b)	w.k.T $\frac{\text{push height}}{\text{push frame}} = \frac{\text{stop height}}{\text{stop frame}}$ $\therefore \text{stop time} = \frac{\text{push height}}{\text{push time}} = \frac{\text{stop height}}{\text{stop time}}$ stop time = $\frac{0.5 \times 5}{0.4} = 6 \text{ frames}$ Push time in Sec = $\frac{5}{30} = 0.16 \text{ s}$ stop time in sec = $\frac{6}{30} = 0.2 \text{ s}$	1M 1M 2M	4M

~~GA~~
Staff

VK
HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test III

Semester & Section: 2nd, A/B sections

Date: 05/04/23

Question No.	Details of the answer	Marks Distribution	Total Marks
(5) (a)	<p><u>Part-C</u></p> <p>Conjugate of a matrix</p> <p>Transpose of a matrix</p> <p>unitary matrix explanation</p>	<p>2M</p> <p>2M</p> <p>2M</p>	6M
(b)	<p>Given: $A = \begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix}$</p> <p>to prove $A^T = A$</p> <p>$A^T = (A^*)^*$</p> <p>$A^T = \begin{bmatrix} 0 & i \\ -i & 0 \end{bmatrix}$, $(A^*)^T = \begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix} = A$</p> <p>$\therefore A^T = A$</p>	<p>1M</p> <p>1M</p> <p>2M</p>	4M
(6) (a)	<p>(a)</p> <p>Descriptive statistics and</p> <p>Inferential statistics</p> <p>explanation</p> <p>Scatter diagrams</p>	<p>2M</p> <p>2M</p> <p>2M</p>	6M
(b)	<p>w.k.T $P(X=k) = \frac{\lambda^k e^{-\lambda}}{k!}$</p> <p>when $k=0, \lambda=4, P(X=k) = 0.0183$</p> <p>when $k=1, \lambda=4, P(X=k) = 0.0732$</p> <p>when $k=2, \lambda=4, P(X=k) = 0.14$</p>	<p>1M</p> <p>3M</p>	4M

Staff

12/8
HOD

CITY ENGINEERING COLLEGE
DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION

Internal Test IV

Semester & Section: Ist, A/B Sections

Date: 05/04/23

Question No.	Details of the answer	Marks Distribution	Total Marks						
<p style="text-align: center;">⑦</p>	<p style="text-align: center;"><u>Part D</u></p> <p>Two qubit quantum logic gates explanation</p> <p>Quantum NOT gate with two different input states explanation</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>(a)</p> </div> <div style="border-collapse: collapse;"> <table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">00</td> <td style="padding: 5px;">00</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">01</td> <td style="padding: 5px;">01</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">10</td> <td style="padding: 5px;">11</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">11</td> <td style="padding: 5px;">10</td> </tr> </table> </div> </div>	00	00	01	01	10	11	11	10
00	00								
01	01								
10	11								
11	10								

Staff

HOD

Year : 2022- 2023

Semester : Odd / Even ✓

Name of the Teacher : Nagashree G

Designation : Asst. Prof

Department : Physics

Sem/Branch	Subject Code	Subject
1. <u>Ist/ AIXML</u>	<u>22PHYS12</u>	<u>Engineering Physics</u>
2. _____	<u>BPHYS102</u>	_____
3. _____	_____	_____

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	<u>GA</u> 31/12/22	<u>GA</u> 30/1/23	<u>GA</u> 27/2/23	<u>GA</u> 29/3/23
HOD	<u>KS</u>	<u>KS</u>	<u>KS</u>	<u>KS</u>
Principal	<u>SKarman</u>		<u>SKarman</u>	

ATTENDANCE

Sl. No.	Reg. No.	Name	14	15	16	17	18	19	20	21	22	23	
			1	2	3	4	5	6	7	8	9	10	11
1	ICE22AI002	Aishwarya G	1	2	3	4	5	6	7	8	9	10	11
2	ICE22AI003	Akash	1	2	3	4	5	6	6	7	8	9	10
3	ICE22AI004	Ananya Hegdekar	1	2	2	3	4	5	6	7	8	9	10
4	ICE22AI005	Anvitha N Rao	1	2	2	3	4	5	6	7	8	9	10
5	ICE22AI006	Arbath Pasha	1	2	3	4	5	6	7	8	9	10	11
6	ICE22AI007	Babji S	1	2	3	4	5	6	7	8	9	9	10
7	ICE22AI008	Bhazath K	1	2	3	4	5	6	7	8	9	10	11
8	ICE22AI009	Bhoomika G	1	2	3	4	4	5	6	7	8	9	10
9	ICE22AI010	C R Hemant	1	2	3	4	5	6	7	8	9	10	11
10	ICE22AI011	Daashan M	1	1	2	3	4	4	5	6	7	7	8
11	ICE22AI012	Deepak C S	1	2	2	3	4	5	5	6	7	7	7
12	ICE22AI013	Deepak D S	1	2	2	3	4	5	6	7	8	9	10
13	ICE22AI014	Dhanush Gowda M	1	2	3	4	5	6	7	8	9	10	11
14	ICE22AI015	Dhanushree C	1	2	2	3	4	5	6	7	8	9	10
15		Garash G K											
16	ICE22AI016	Haini J C	1	2	3	4	5	6	7	8	9	10	11
17	ICE22AI017	Haashavardhan G	1	2	3	4	4	5	6	7	8	9	10
18	ICE22AI019	Hemant	1	2	3	4	5	6	7	8	9	10	11
19	ICE22AI	Hemant Kumar K											
20	ICE22AI020	Jarani S	1	2	3	4	5	6	7	8	9	10	11
21	ICE22AI021	K Shai Hoi	1	2	3	3	4	5	6	7	8	9	10
22	ICE22AI022	Kanchana N	1	2	3	4	5	6	6	7	8	9	10
23	ICE22AI023	Kanya G	1	2	3	4	5	6	7	8	9	10	11
24	ICE22AI024	Koogthan S	1	2	3	4	5	6	7	8	9	10	11
25	ICE22AI025	Khashda Mascot	1	2	3	4	4	5	6	7	8	9	10
	No. of Absents												
	Initials												

04	01	23	05	01	23	06	01	23	07	01	23	12	01	23	16	01	23	18	01	23	19	01	23	20	01	23
12	13	14	15	15	16	16	17	18	18	18	19	18	18	19	18	18	19	18	18	19	18	18	19	18	18	19
12	13	14	15	15	16	16	17	18	18	19	18	18	19	18	18	19	18	18	19	18	18	19	18	18	19	
10	12	13	14	15	16	17	18	18	19	19	18	18	19	18	18	19	18	18	19	18	18	19	18	18	19	
11	12	13	14	15	16	17	18	18	19	19	18	18	19	18	18	19	18	18	19	18	18	19	18	18	19	
11	12	13	14	15	16	17	18	18	19	19	18	18	19	18	18	19	18	18	19	18	18	19	18	18	19	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
10	11	12	13	14	15	16	17	18	19	19	18	18	19	18	18	19	18	18	19	18	18	19	18	18	19	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
11	12	13	14	15	16	17	18	19	20	20	19	19	20	19	19	20	19	19	20	19	19	20	19	19	20	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
9	10	11	12	13	14	15	16	17	18	18	17	17	18	17	17	18	17	17	18	17	17	18	17	17	18	
8	9	10	11	12	13	14	15	16	17	17	16	16	17	16	16	17	16	16	17	16	16	17	16	16	17	
11	12	13	14	15	16	17	18	19	20	20	19	19	20	19	19	20	19	19	20	19	19	20	19	19	20	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
11	12	13	14	15	16	17	18	19	20	20	19	19	20	19	19	20	19	19	20	19	19	20	19	19	20	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
11	11	12	13	14	15	16	17	18	19	19	18	18	19	18	18	19	18	18	19	18	18	19	18	18	19	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
11	12	13	14	15	16	17	18	19	20	20	19	19	20	19	19	20	19	19	20	19	19	20	19	19	20	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
11	12	13	14	15	16	17	18	19	20	20	19	19	20	19	19	20	19	19	20	19	19	20	19	19	20	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
11	12	13	14	15	16	17	18	19	20	20	19	19	20	19	19	20	19	19	20	19	19	20	19	19	20	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
11	12	13	14	15	16	17	18	19	20	20	19	19	20	19	19	20	19	19	20	19	19	20	19	19	20	
12	13	14	15	16	17	18	19	20	21	21	20	20	21	20	20	21	20	20	21	20	20	21	20	20	21	
11	12	13	14	15	16	17	18	19	20	20	19	19	20	19	19	20	19	19	20	19	19	20	19	19	20	

CITY ENGINEERING COLLEGE

(Doddakallandra, Off Kanakapura Road, Bangalore-560061)

Department of Chemistry



Faculty Academic File

NAME: Dr. Sunitha N

DESIGNATION: Assoc. prof.

SEMESTER: I (odd SEM)

SECTION: DIE - CS I SEM

SUBJECT NAME & CODE: Applied chemistry for CS stream
BCHES102

ACADEMIC YEAR: 2022-2023



CITY
ENGINEERING COLLEGE

VISION

Making Remarkable Contribution by Disseminating Knowledge on Emerging Trends in Engineering and Technology through various Programmes, Innovation and Research so as to Excel in Quality both at National and International level and to provide Career Guidance & Training for Employment.

MISSION

M1- To encourage Knowledge Acquisition and Foster Innovation & Research.

M2- To Prepare Students for Immediate Employment, leading to Technological and Socio- economical growth.

M3- To Provide Guidance for a Productive Career under various programmes.



CITY
ENGINEERING COLLEGE

PROGRAM OUTCOMES (PO)

PO1 – Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 – Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 – Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 – Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 – Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 – The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 – Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 – Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 – Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 – Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 – Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 – Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



CITY
ENGINEERING COLLEGE

DEPARTMENT OF CHEMISTRY

VISION

- To convey knowledge on engineering chemistry to stakeholders for engineering applications.

MISSION

- Facilitate the faculty to strengthen their knowledge and skills using ICT tools.
- Motivate and train students in theory and laboratory practices.
- Succeed to deal with societal issues like preserving green environment.



CITY
ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE

CIRCULAR

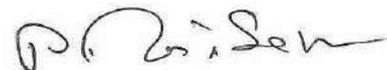
Ref No: CEC/BS/DAC/ACY 2022-23/OR/01

Date: 30-11-2022

This is to inform the members of Department Advisory Committee that meeting is scheduled on 01-12-2022 at 10: 00 AM in Physics Laboratory.

Agenda:

- Commencement of classes for 1st semester students
- Phase I Student Induction Programme for 1st semester students
- Conduction of Talents day
- Organizing value added courses/ circular courses in the curriculum


Convener
Dr. Rajasekhar. P


HOD
Dr. Jyothi. P


PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061



DEPARTMENT OF BASIC SCIENCE

Department Advisory Committee Meeting

Date: 01-12-2022 & 02-12-2022

Time: 10:00 AM

Venue: Physics Laboratory

DAC members present in the meeting

Sl. No	Member Name	Designation	Role	Signature
1	Dr. Rajasekhar. P	HOD & Professor	Convener	
2	Dr. Jyothi. P	HOD & Professor	Member	
3	Mrs. Nagasree. G	Assistant Professor	Member	
4	Dr. Sunitha. N	Associate Professor	Member	
5	Mrs. Vanitha. G.R	Assistant Professor	Member	
6	Mr. Rekha. R	Assistant Professor	Member	
7	Mrs. Anitha. C. V	Assistant Professor	Member	
8	Ms. Janavi. R	Assistant Professor	Member	
11	Mr. Arjun	Assistant Professor	Member	
12	Mr. Sadashiva. R	Assistant Professor	Member	
13	Mr. Dinesh	Assistant Professor	Member	
14.	Mr. Sudish Kumar. N	TCS, Manager.	Employer (Industry Expert)	

Agenda of the Meeting:

- Commencement of classes for 1st semester students from 14th December 2022.
- Phase I Student Induction Programme for 1st semester students on 5th to 13th December 2022.
- Conduction of Talents day
- Organizing value added courses/ circular courses in the curriculum like Basic Entrepreneurship Skills, Personal Enrichment Skills.
- National Mathematics Day is celebrated on 22 December to mark the birth anniversary of legendary Indian mathematician, Srinivasa Ramanujam as to be celebrated as Ramanujam Day on 22/12/2022.

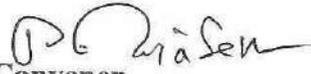


CITY
ENGINEERING COLLEGE

Minutes of Meeting:

The members discussed suggestions for improvement and reviewed the meeting agenda.

- The committee decided to organize value added course on Basic Entrepreneurship Skills, Personal Enrichment Skills by considering industry expert views from 20th to 24th February, 2023.
- It was proposed to conduct Ramanujam Day on 22/12/2022 to mark the birth anniversary of legendary Indian mathematician, Srinivasa Ramanujam.
- It was discussed to conduct Talents day and sports day.


Convener
Dr. Rajasekhar. P


HOD
Dr. Jyothi. P


PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23

DEPARTMENT OF BASIC SCIENCE

COURSE PREFERENCE ODD SEMESTER

Name of the Faculty: Dr. Sunitha. N

Designation: Associate Professor

Sl. No	Course Code and Name	Year/Semester
1.	BCHE102 Applied Chemistry for Computer Science & Engineering Scheme For D,E sections	2022/I

Signature of Faculty

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061



ACADEMIC YEAR: 2022-23

DEPARTMENT OF BASIC SCIENCE

COURSE ALLOCATION FOR ODD SEMESTER

Sl. No.	Name of the Faculty	Course code & Name	Year/Semester	Signature
1.	Dr. Rajasekhar. P	BCHE102 Applied Chemistry for Computer Science & Engineering Scheme	2022/I For F section	
2.	Dr. Sunitha .N	BCHE102 Applied Chemistry for Computer Science & Engineering Scheme	2022/I For D, E sections	
3.	Mrs. Anuradha. U	BCHE102 Applied Chemistry for Computer Science & Engineering Scheme	2022/I Laboratory	
4.	Ms. Soumya .P	BCHE102 Applied Chemistry for Computer Science & Engineering Scheme	2022/I Laboratory	

Signature of Faculty

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (Odd SEM)

SEPTEMBER 2022		OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEB 2023			
DAY	Date	EVENT	Dat	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
WED					2						1	3 rd sem –III CIE	
THU	1				3		1				2		
FRI	2				4		2				3		
SAT	3		1		5		3				4		
SUN	4		2		6		4		1		5		
MON	5		3		7		5		2	3 rd -II CIE 7 th sem vtu practical exam starts	6		
TUE	6		4	Ayudha pooja	8		6		3		7		
WED	7		5	Vijaya dashami	9		7		4		8		
THU	8		6		10		8		5		9		
FRI	9		7		11	Kanakadasa Jayanthi	9		6		10		
SAT	10	2 nd Saturday holiday	8	2 nd Saturday holiday	12	2 nd Saturday holiday	10	2 nd Saturday holiday	7		11	3 rd Sem LWD 2 nd Saturday holiday	
SUN	11		9		13		11		8		12		
MON	12		10	START OF 5 TH SEM / START OF I SEM	14	5 th I CIE	12	5 th sem II CIE	9		13	5 th sem theory exam 3 rd sem practical exam	
TUE	13		11		15		13		10	14			
WED	14		12		16		14		11	15			
THU	15		13		17		15		12		16		
FRI	16		14		18		16		13		17		
SAT	17		15		19		17		14	2 nd Saturday holiday	18		
SUN	18		16		20		18		15	Makara Sankranthi	19		
MON	19	START OF 7 TH SEMESTER	17	7 th sem-I CIE	21	7 th sem-II CIE	19	7 th sem-III CIE	16	7 th sem vtu theory 5 th sem III CIE	20		
TUE	20		18		22		20		17	5 th sem III CIE	21		
WED	21		19		23		21		18	5 th sem III CIE	22	3 rd sem theory exam	
THU	22		20		24		22		19		23		
FRI	23		21		25		23		20		24		
SAT	24	4 th Saturday holiday	22	4 th Saturday holiday	26	4 th Saturday holiday	24	4 th Saturday holiday	21		25	4 th Saturday holiday	
SUN	25		23		27		25	Christmas	22		26		
MON	26		24	Naraka chaturdashi	28	3 rd sem-I CIE	26		23		27		
TUE	27		25		29		27	24		24		28	
WED	28		26	Balipadyami	30		28	25		25			

THU	29		27			29		26	Republic Day		
FRI	30		28			30		27	5 th sem LWD		
SAT			29			31	7 th sem LWD	28	4 th Saturday holiday		
SUN			30					29			
MON			31	START OF 3rd SEMESTER				30	5 th sem exam – practical exam		
TUE			1/11	Rajyotsava				31			


 PRINCIPAL
CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE, BENGALURU-560061. DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES ACADEMIC CALENDAR 2022-23 (ODD SEM)

SEPTEMBER 2022		OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEB 2023			
DAY	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT	
					1	RAJYOTSAVA							
WED					2						1		
THU	1				3		1	MOM ON CURRICULUM			2	3 RD SEM -III CIE	
FRI	2				4		2	MOM ON CURRICULUM ENRICHMENT			3		
SAT	3		1		5		3				4		
SUN	4		2		6		4			1	5		
MON	5		3		7		5	INAUGRATION and ORIENTATION - 1 ST SEM	2	3 RD -II CIE 7 TH SEM VTU PRACTICAL EXAM STARTS	6		
TUE	6		4	AYUDHA POOJA	8		6		3		7		
WED	7		5	VIJAYA DASHAMI	9		7		4		8		
THU	8		6		10		8	TALENTS DAY	5		9		
FRI	9		7		11	KANAKADASA JAYANTHI	9		6		10		
SAT	10	2 ND SATURDAY HOLIDAY	8	2 ND SATURDAY HOLIDAY	12	2 ND SATURDAY HOLIDAY	10	2 ND SATURDAY HOLIDAY	7		11	3 RD SEM LWD 2 ND SATURDAY HOLIDAY	
SUN	11		9		13		11		8		12		
MON	12		10	START OF 5 TH SEM / START OF I SEM	14		12	5 TH SEM II-CIE	9		13	5 TH SEM THEORY EXAM 3 RD SEM PRACTICAL EXAM	
TUE	13	MOM ON CURRICULUM MOM ON CURRICULUM ENRICHMENT	11		15		13		5 TH I-CIE	10		14	
WED	14		12		16		14		START OF 1 ST SEM	11		15	
THU	15		13		17		15		12		16		
FRI	16		14		18		16		13	TALENTS DAY	17		
SAT	17		15		19		17		14	2 ND SATURDAY HOLIDAY	18		
SUN	18		16		20		18		15	MAKARA SANKRANTHI	19		
MON	19	START OF 7 TH SEMESTER	17	7 TH SEM-I CIE	21	7 TH SEM-II CIE	19	7 TH SEM-III CIE	16	7 TH SEM VTU THEORY 5 TH SEM III CIE	20		
TUE	20		18		22		20		17	5 TH SEM III CIE	21		
WED	21		19		23		21		18	5 TH SEM III CIE	22	3 RD SEM THEORY EXAM	
THU	22		20		24		22		19		23		
FRI	23		21		25		23		20		24		
SAT	24	4 TH SATURDAY HOLIDAY	22	4 TH SATURDAY HOLIDAY	26	4 TH SATURDAY HOLIDAY	24	4 TH SATURDAY HOLIDAY	21		25	4 TH SATURDAY HOLIDAY	
SUN	25		23		27		25	CHRISTMAS	22		26		
MON	26		24	NARAKA CHATURDASHI	28	3 RD SEM-I CIE	26		23		27		
TUE	27		25		29		27		24		28		
WED	28		26	BALIPADYAMI	30		28		25				
THU	29		27				29		26	REPUBLIC DAY			
FRI	30		28				30		27	5 TH SEM LWD			
SAT			29				31	7 TH SEM LAST WORKING DAY	28	4 TH SATURDAY HOLIDAY			
SUN			30						29				
MON			31	START OF 8 RD SEM					30	5 TH SEM EXAM -PRACTICAL EXAM			
TUE									31				


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 KanaKapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE
TIMETABLE – FIRST SEMESTER – DECEMBER – 2022-23
CHEMISTRY CYCLE

SECTION: D

BRANCH: CS

ROOM NO: A004

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	MATS	ENG	BREAK	PLC15B	CHES	LUNCH	←--CHEL/ CEDL/MATL /D ₁ /D ₂ /D ₃ ----→		
TUE	PLC15B	ESC143		MATS	SFH		←----- PLCL / D1 -----→		
WED	CHES	ICO		ESC143			←---- CHEL/CEDL/MATL/D ₂ /D ₃ /D ₁ --→		
THU	ESC143	←-CHEL/		CEDL/ MATL /D ₃ /D ₁ /D ₂ →			←----- PLCL / D2-----→		
FRI	MATS	CHES		CED			← ----- PLCL / D3-----→		
SAT	MATS(T)	CHES(T)		DEPT/COLLEGE ACTIVITIES/LIBRARY					
SUBJECT CODE	SUBJECT NAME			NO. OF HOURS	FACULTY NAME				
22MATS11	Mathematics for CSE Stream			4	Janavi				
22CHES12	Chemistry for CSE Stream			4	Dr. Sunitha. N				
22CED13	Computer Aided Engineering Drawing			2	Dr. Uma				
22ESC143	Introduction to Electronics Engineering			3	Prof. Mallikarjuna.G.S				
22PLC15B	Introduction to Python Programming			2	Ramesh				
22ENG16	Communicative English			1	Arjun				
22ICO17	Indian Constitution			1	Arjun				
22SFH18	Scientific Foundation of Health			1	Vinay				
MATL	Mat Lab			3x3	Anitha / Janavi				
CHEL	Chemistry Lab			3x3	Dr. P. Rajasekhar / Dr. Sunitha.N				
CEDL	Computer Aided Engineering Drawing Lab			3x3	Anil Kumar / Dr. S. Karunakara/ Harsha Vardhan.U				
PLCL	Python Programming Lab			3x3					

Dr. P. Vinay
HOD

Dr. P. Vinay
PRINCIPAL
CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE
TIMETABLE – FIRST SEMESTER - CHEMISTRY CYCLE
DECEMBER – 2022-23

SECTION: E

BRANCH: CS

ROOM NO: A003

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	ESC143	CHES	BREAK	CED		Lunch	←----- PLCL / E1-----→		
TUE	MATS	ICO		CHES	ESC143		←--CHEL/ CEDL/MATL/E ₁ /E ₂ /E ₃ ----→		
WED	ESC143	←CHEL/		CEDL/MATL E ₂ /E ₃ /E ₁ →			←-----PLCL / E2-----→		
THU	CHES	MATS		PLC15B			←--CHEL/ CEDL/MATL /E ₃ /E ₁ /E ₂ ----→		
FRI	PLC15B	ENG		MATS	CHE(T)		←----- PLCL / E3 -----→		
SAT	SFH	MATS(T)		DEPT/COLLEGE ACTIVITIES/LIBRARY					
SUBJECT CODE		SUBJECT NAME			NO. OF HOURS	FACULTY NAME			
22MATS11		Mathematics for CSE Stream			4	Vanitha.G			
22CHES12		Chemistry for CSE Stream			4	Dr. Sunitha.N			
22CED13		Computer Aided Engineering Drawing			2	Dr. S. Karunakara			
22ESC143		Introduction to Electronics Engineering			3	Shylaja.K			
22PLC15B		Introduction to Python Programming			2	Ramesh			
22ENG16		Communicative English			1	Arjun			
22ICO17		Indian Constitution			1	Arjun			
22SFH18		Scientific Foundation of Health			1	Vinay			
MATL		Mat Lab			3x3	Anitha / Janavi			
CHEL		Chemistry Lab			3x3	Dr. P.Rajasekhar / Dr. Sunitha.N			
CEDL		Computer Aided Engineering Drawing Lab			3x3	Anil Kumar / Dr. S Karunakara/ Harsha Vardhan.U			
PLCL		Python Programming Lab			3x3				

P. P. S. Kumar


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 051

CITY ENGINEERING COLLEGE
TIMETABLE – FIRST SEMESTER – DECEMBER – 2022-23
CHEMISTRY CYCLE

Dr. SUNITHA. N (SN)

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON		E	BREAK		D	LUNCH	←---D ₁ LAB SN+SS-----→		
TUE				E			←---E ₁ LAB SN+SS-----→		
WED	D						←---D ₂ LAB SN+SS-----→		
THU	E	← D ₃ LAB		SN+SS-----→					
FRI		D		E					
SAT		D							


HOD


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061

PRINCIPAL

Computer Science and Engineering and allied branches(Chemistry group)

Course Title:	Applied Chemistry for Computer Science & Engineering stream		
Course Code:	BCHE102/202	CIEMarks	50
Course Type(Theory/Practical/Integrated)	Integrated	SEEMarks	50
		Total Marks	100
TeachingHours/Week(L:T:P:S)¹	2:2:2:0	Exam Hours	03
TotalHoursofPedagogy	40hoursTheory+ 10to12Labslots	Credits	04
Courseobjectives <ul style="list-style-type: none"> Toenablestudentstoacquireknowledgeonprinciplesofchemistryforengineeringapplications. Todevelopanintuitiveunderstandingofchemistrybyemphasizingtherelatedbranchesofengineering. Toprovidestudentswithasolidfoundationinanalyticalreasoningrequiredtosolvesocietalproblems. 			
Teaching-LearningProcess Theseare samplestrategies,whichteachercanusetooacceleratetheattainmentofthevariouscourseoutcomesandmakeTeaching-Learningmoreeffective <ul style="list-style-type: none"> Tutorial&remedialclassesforneedystudents(notregularT/R) ConductingMakeupclasses/Bridgecourses forneedystudents Demonstrationofconceptseitherbybuildingmodelsorbyindustryvisit Experimentsinlaboratoriesshallbeexecutedinblendedmode(conventionalornon-conventionalmethods) UseofICT-Onlinevideos,onlinecourses Useofonlineplatformsforassignments/Notes/Quizzes(Ex.Googleclassroom) 			
MODULE1:SensorsandEnergySystems(8hr)			
Sensors: Introduction, working, principle and applications of Conductometric sensors, Electrochemical sensors, Thermometric sensors (Flame photometry) and Optical sensors (colorimetry). Sensors for the measurement of dissolved oxygen (DO). Electrochemical sensors for the pharmaceuticals. Electrochemical gas sensors for SO _x and NO _x . Disposable sensors in the detection of biomolecules and pesticides.			
Energy Systems: Introduction to batteries, construction, working and applications of Lithium ion and Sodium ion batteries. Quantum Dot Sensitized Solar Cells (QDSSC's)-Principle, Properties and Applications.			
Self-learning: Types of electrochemical sensor, Gas sensor - O ₂ sensor, Biosensor - Glucose sensors.			
MODULE2:MaterialsforMemoryandDisplaySystems(8hr)			
Memory Devices: Introduction, Basic concepts of electronic memory, History of organic/polymer electronic memory devices. Classification of electronic memory devices.			

1.NOTE:Whereverthecontact hoursisnotsufficient,tutorialhourcanbeconvertedto theoryhours

types of organic memory devices (organic molecules, polymeric materials, organic-inorganic hybrid materials).

Display Systems: Photoactive and electroactive materials, Nanomaterials and organic materials used in optoelectronic devices. Liquid crystals (LC's) - Introduction, classification, properties and application in Liquid Crystal Displays (LCD's). Properties and application of Organic Light Emitting Diodes (OLED's) and Quantum Light Emitting Diodes (QLED's), Light emitting electrochemical cells.

Self-learning: Properties and functions of Silicon (Si), Germanium (Ge), Copper (Cu), Aluminium (Al), and Brominated flame retardants in computers.

MODULE 3: Corrosion and Electrode System (8hr)

Corrosion Chemistry: Introduction, electrochemical theory of corrosion, types of corrosion - differential metal and differential aeration. Corrosion control - galvanization, anodization and sacrificial anode method. Corrosion Penetration Rate (CPR) - Introduction and numerical problem.

Electrode System: Introduction, types of electrodes. Ion selective electrode - definition, construction, working and applications of glass electrode. Determination of pH using glass electrode. Reference electrode - Introduction, calomel electrode - construction, working and applications of calomel electrode. Concentration cell - Definition, construction and Numerical problems.

Analytical Techniques: Introduction, principle and instrumentation of Conductometry; its application in the estimation of weak acid. Potentiometry; its application in the estimation of iron.

Self-learning: IR and UV-Visible spectroscopy.

MODULE 4: Polymers and Green Fuels (8hr)

Polymers: Introduction, Molecular weight - Number average, weight average and numerical problems. Preparation, properties, and commercial applications of kevlar. Conducting polymers - synthesis and conducting mechanism of polyacetylene and commercial applications.

Green Fuels: Introduction, construction and working of solar photovoltaic cell, advantages, and disadvantages. Generation of energy (green hydrogen) by electrolysis of water and its advantages.

Self-learning: Regenerative fuel cells

MODULE 5: E-Waste Management (8hr)

E-Waste: Introduction, sources of e-waste, Composition, Characteristics, and Need of e-waste management. Toxic materials used in manufacturing electronic and electrical products, health hazards due to exposure to e-waste. Recycling and Recovery: Different approaches of recycling (separation, thermal treatments, hydrometallurgical extraction, pyrometallurgical methods, direct recycling). Extraction of gold from E-waste. Role of stakeholders in environmental management of e-waste (producers, consumers, recyclers, and statutory bodies).

Self-learning: Impact of heavy metals on environment and human health.

PRACTICAL MODULE

A - Demonstration (any two) offline/virtual:

A1. Chemical Structure drawing using software: ChemDraw or ACD/ChemSketch

A2. Determination of strength of an acid in Pb-acid battery
A3: Synthesis of Iron-oxide Nanoparticles

A4. Electrolysis of water

B-Exercise (compulsorily any 4 to be conducted):

B1. Conductometric estimation of acid mixture

B2. Potentiometric estimation of FA using $K_2Cr_2O_7$

B3. Determination of pK_a of vinegar using pH sensor (Glass electrode)

B4. Determination of rate of corrosion of mild steel by weight loss method B5.

Estimation of total hardness of water by EDTA method

C-Structured Enquiry (compulsorily any 4 to be conducted):

C1. Estimation of Copper present in electroplating effluent by optical sensor

(colorimetry) C2. Determination of Viscosity coefficient of lubricant (Ostwald's viscometer)

C3. Estimation of iron in TMT bar by diphenyl amine/external indicator

method C4. Estimation of Sodium present in soil/effluent sample using flame photometry

C5. Determination of Chemical Oxygen Demand (COD) of industrial wastewater sample

D-Open Ended Experiments (any two):

D1: Evaluation of acid content in beverages by using pH sensors and simulation. D2.

Construction of photovoltaic cell.

D3. Design an experiment to identify the presence of proteins in given sample.

D4. Searching suitable PDB file and target for molecular docking

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

CO1.	Identify the terms processes involved in scientific and engineering and applications
CO2.	Explain the phenomena of chemistry to describe the methods of engineering processes
CO3.	Solve the problems in chemistry that are pertinent in engineering applications
CO4.	Apply the basic concepts of chemistry to explain the chemical properties and processes
CO5.	Analyze properties and multi processes associated with chemical substances in disciplinary situations

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation (CIE):

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

CIE for the theory component of the IC

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15th week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

Semester End Examination(SEE):

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

Suggested Learning Resources:

Books(TitleoftheBook/Nameoftheauthor/Nameofthepublisher/EditionandYear)

1. WileyEngineeringChemistry, WileyIndiaPvt.Ltd.NewDelhi,2013-2ndEdition.
2. EngineeringChemistry, Satyaprakash&ManishaAgrawal, KhannaBookPublishing, Delhi
3. ATextBookofEngg. Chemistry, ShashiChawla, DhanpatRai&Co.(P)Ltd.
4. EssentialsofPhysicalChemistry. Bahl&Tuli, S.ChandPublishing
5. AppliedChemistry, SunitaRattan, Kataria5. EngineeringChemistry, Baskar, Wiley
6. EngineeringChemistry-I, D.Groukrishana, VikasPublishing
7. ATextbookofEngineeringChemistry, SSDara&Dr.SSUmare, SChand&CompanyLtd., 12thEdition, 2011.
8. ATextBookofEngineeringChemistry, R. V. GadagandNityanandaShetty, I.K.InternationalPublishinghouse. 2ndEdition, 2016.
9. TextBookofPolymerScience, F.W.Billmeyer, JohnWiley&Sons, 4thEdition, 1999.
10. NanotechnologyAChemicalApproachtoNanomaterials, G.A.Ozin&A.C.Arsenault, RSCPublishing, 2005
11. CorrosionEngineering, M.G.Fontana, N.D.Greene, McGrawHillPublications, NewYork, 3rdEdition, 1996.

12. Linden's Handbook of Batteries, Kirby W. Beard, Fifth Edition, McGraw Hill, 2019.
13. OLED Display Fundamentals and Applications, Takatoshi Tsumimura, Wiley-Blackwell, 2012
14. Supercapacitors: Materials, Systems, and Applications, Max Lu, Francois Beguin, Elzbieta Frackowiak, Wiley-VCH; 1st edition, 2013.
15. "Handbook on Electroplating with Manufacture of Electrochemicals", ASIAPACIFIC BUSINESS PRESS Inc., 2017. Dr.H. Panda,
16. Expanding the Vision of Sensor Materials. National Research Council 1995, Washington, DC: The National Academies Press. doi:10.17226/4782.
17. Engineering Chemistry, Edited by Dr. Mahesh Band and Dr. Roopashree B. Sunstar Publisher, Bengaluru, ISBN 978-93-85155-70-3, 2022
18. High Performance Metallic Materials for Cost Sensitive Applications, F.H. Froes, et al. John Wiley & Sons, 2010
19. Instrumental Methods of Analysis, Dr. K. R. Mahadik and Dr. L. Sathiyarayanan, Nirali Prakashan, 2020
20. Principles of Instrumental Analysis, Douglas A. Skoog, F. James Holler, Stanley R. Crouch Seventh Edition, Cengage Learning, 2020
21. Polymer Science, VR Gowariker, NV Viswanathan, Jayadev, Sreedhar, Newage Int. Publishers, 4th Edition, 2021
22. Engineering Chemistry, PC Jain & Monica Jain, Dhanpat Rai Publication, 2015-16th Edition.
23. Nanostructured materials and nanotechnology, Hari Singh, Nalwa academic press, 1st Edition, 2002.
24. Nanotechnology Principles and Practices, Sulabha K Kulkarni, Capital Publishing Company, 3rd Edition 2014
25. Principles of nanotechnology, Phanikumar, Scitech publications, 2nd Edition, 2010.
26. Chemistry for Engineering Students, B. S. Jai Prakash, R. Venugopal, Sivakumaraiah & Pushpalayengar., Subash Publications, 5th Edition, 2014
27. "Engineering Chemistry", O. G. Palanna, Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint, 2015.
28. Chemistry of Engineering materials, Malini S, KS Anantha Raju, CBS publishers Pvt Ltd.,
29. Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

Weblinks and Video Lectures (e-Resources):

- <http://libgen.rs/>
- <https://nptel.ac.in/downloads/122101001/>
- <https://nptel.ac.in/courses/104/103/104103019/>
- <https://ndl.iitkgp.ac.in/>
- <https://www.youtube.com/watch?v=faESCxAWR9k>
- <https://www.youtube.com/watch?v=TBqXMWaxZYM&list=PLyhmwFtznRhuz8L1bb3X-9IbHrDMjHWWWh>
- <https://www.youtube.com/watch?v=j5Hml6KN4TI>
- <https://www.youtube.com/watch?v=X9GHBdyYcyo>
- <https://www.youtube.com/watch?v=1xWBPZnEJk8>
- <https://www.youtube.com/watch?v=wRAo-M8xBHM>

ActivityBasedLearning(SuggestedActivitiesinClass)/PracticalBasedlearning

- <https://www.vlab.co.in/broad-area-chemical-sciences>
- <https://demonstrations.wolfram.com/topics.php>
- <https://interestingengineering.com/science>

COsandPOsMapping(Individualteacherhastofillup)

PO												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1				1					
CO2	3	1	1				1					
CO3	3	1	1				1					
CO4	3	1	1				1					
CO5	3	1	1				1					

P. P. Raja Kumar

CITY ENGINEERING COLLEGE

DEPARTMENT OF CHEMISTRY

LESSON PLAN FOR ODD SEMESTER FOR ACADEMIC YEAR 2022-2023

Course Title: Engineering Chemistry	Course Code : BCHES102
Total contact hours: L:T:P:S :: 2:2:0:0	SEE Marks : 50
Internal Marks : 50	CIE Marks: 50
Course : Integrated	Academic year : 2022-2023
Lesson plan Author: Dr. P. Rajasekhar & Dr. Sunitha. N	Date : 21/1/2023

Course Objective:

- To enable students to acquire knowledge on principles of chemistry for engineering applications.
- To develop an intuitive understanding of chemistry by emphasizing the related branches of engineering.
- To provide students with a solid foundation in analytical reasoning required to solve societal problems.

Teaching-Learning Process (General Instructions):

These are sample Strategies; which teachers can use to accelerate the attainment of the various course outcomes and make teaching-learning more effective.

- Tutorial & remedial classes for need y students
- Conducting makeup classes/bridge courses for needy students
- Experiments in laboratories shall be executed in blended mode
- Use of ICT-online videos, online courses
- Use of online platforms for assignments/notes/quizzes

Week	Days/ Date	MODULE -1	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Sensors: working, principle and applications of Conductometric sensors	R, U	CO1
	2	working, principle and applications of Thermometric sensors	R,U	CO1
	3	Working, principle and applications Optical sensors (colorimetry)	R,U	CO1
	4	working, principle and applications of Electrochemical sensors	R,U	CO1
2	1	Sensors for the measurement of dissolved oxygen (DO)	R,U	CO1
	2	Electrochemical sensors for the pharmaceuticals	R,U	CO1
	3	Electrochemical gas sensors for Sox and NOx.	R,U	CO1
	4	Energy Systems: construction, working and applications of Lithium ion batteries	R,U	CO1

3	1	construction, working and applications of Sodium ion batteries	R,U	CO2
	2	Quantum Dot Sensitized Solar cells (QDSSC'S) Principle, properties and applications.	R,U	CO2
		MODULE-2		
	3	Memory Devices: Classification of electronic memory devices	R,U	CO2
	4	Types of organic memory devices (organic molecules, polymeric materials, organic inorganic hybrid materials).	R,U	CO2
4	1	Photoactive and electroactive materials	R,U	CO2
	2	Nano materials and organic materials used in optoelectronic devices.	R,U	CO2
	3	Properties and application of Organic Light Emitting Diodes (OLED's)	R,U	CO2
	4	Light emitting electrochemical cells	R,U	CO2
5	1	Display Systems: Liquid crystals (LC's) - Introduction, classification, properties and application in Liquid Crystal Displays (LCD's).	R,U	CO2
	2	Properties and application of Quantum Light Emitting Diodes (QLED's)	R,U	CO2
		MODULE-3		
	3	Corrosion: Introduction, electrochemical theory of corrosion	R,U	CO3
	4	Types of corrosion- Differential metal and aeration corrosion	R,U	CO3
6	1	Corrosion control: Galvanization, anodisation	E	CO3

	2	Sacrificial anode method, CPR - Introduction	R,U	CO3
	3	Numerical problems	E	CO3
	4	Electrode System: Introduction, types of electrodes, Calomel electrode construction and its working	R,U	CO3
7	1	Construction and working of concentration cell	R,U	CO3
	2	Numerical Problems	E	CO3

	2	Numerical Problems	E	CO3
	3	Ion selective electrode- construction and working of Ion selective electrode	R,U	CO3
	4	Determination of pH using Glass electrode	R,U	CO3
	1	Analytical Techniques: Introduction, principle and instrumentation of conductometry	R,U	CO3
8	2	Application in the estimation of weak acid	R,U	CO4
	3	Introduction, principle and instrumentation of potentiometry	R,U	CO4
	4	Application in the estimation of Fe	R,U	CO4
		MODULE-4		
9	1	Polymers: Introduction, Molecular weight - Number average, weight average and numerical problems.	R,U, E	CO4
	2	Preparation, properties, and commercial applications of kevlar.	R,U	CO4
	3	Synthesis and conducting mechanism of polyacetylene and commercial applications.	R,U	CO4
	4	Preparation, properties and commercial applications of graphene	R,C,U	CO4
10	1	Green Fuels: Introduction, Construction and working of solar photovoltaic cell	C	CO4

	2	Generation of H ₂ by electrolysis of water	R,U,	CO5
	3	Generation of H ₂ by polymer membrane electrolysis.	R,U	CO5
		MODULE-5		
	4	Introduction, sources of e-waste Composition	R,U	CO5
11	1	Characteristics and need of e-waste management.	R,U	CO5
	2	Toxic materials used in manufacturing electronic and electrical products	R,U	CO5
	3	Health hazards due to exposure to e-waste	R,U	CO5
	4	Different approaches of recycling separation, thermal treatments	R,U	CO5
12	1	Hydrometallurgical extraction, pyro metallurgical method	R,U	CO5
	2	Direct recycling	R,U	CO5
	3	Role of stakeholders in environmental management of e-waste	R,U	CO5
	4	Extraction of gold from e-waste	R,U	CO5

Bloom's Taxonomy Level

R-Remembering U-Understanding A1-Applying A2-Analysing E-Evaluating C-Creating

Course outcome (CourseSkillSet) At the end of the course the student will be able to:

- CO1. Identify the terms and applications processes involved in scientific and engineering
- CO2. Explain the phenomena of chemistry to describe the methods of engineering processes
- CO3. Solve the problems in chemistry that are pertinent in engineering applications
- CO4. Apply the basic concepts of chemistry to explain the chemical properties and processes
- CO5. Analyze properties and multi disciplinary situations processes associated with chemical substance

Suggested Learning Resources: Books

(Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1. Wiley Engineering Chemistry, Wiley India Pvt. Ltd. New Delhi, 2013-2nd Edition.
2. Engineering Chemistry, Satyaprakash & Manisha Agrawal, Khanna Book Publishing, Delhi
3. A Text Book of Engg. Chemistry, Shashi Chawla, Dhanpat Rai & Co. (P) Ltd.
4. Essentials of Physical Chemistry, Bahl & Tuli, S. Chand Publishing
5. Applied Chemistry, Sunita Rattan, Kataria
5. Engineering Chemistry, Baskar, Wiley
6. Engineering Chemistry-I, D. Groun Krishana, Vikas Publishing
7. A Textbook of Engineering Chemistry, S. S. Dara & Dr. S. S. Umare, S. Chand & Company Ltd., 12th Edition, 2011.
8. A Textbook of Engineering Chemistry, R. V. Gadag and Nityananda Shetty, I. K. International Publishing House, 2nd Edition, 2016.
9. Textbook of Polymer Science, F. W. Billmeyer, John Wiley & Sons, 4th Edition, 1999.
10. Nanotechnology A Chemical Approach to Nanomaterials, G. A. Ozin & A. C. Arsenault, RSC Publishing, 2005.
11. Corrosion Engineering, M. G. Fontana, N. D. Greene, McGraw Hill Publications, New York, 3rd Edition, 1996.
12. Linden's Handbook of Batteries, Kirby W. Beard, Fifth Edition, McGraw Hill, 2019.
13. OLED Display Fundamentals and Applications, Takatoshi Tsujimura, Wiley-Blackwell, 2012
14. Supercapacitors: Materials, Systems, and Applications, Max Lu, Francois Beguin, Elzbieta Frackowiak, Wiley-VCH, 1st Edition, 2013.
15. "Handbook on Electroplating with Manufacture of Electrochemicals", ASIAPACIFIC BUSINESS PRESS Inc., 2017. Dr. H. Panda,
16. Expanding the Vision of Sensor Materials. National Research Council 1995, Washington, DC: The National Academies Press. doi:10.17226/4782.
17. Engineering Chemistry, Edited by Dr. Mahesh Band and Dr. Roopashree B, Sunstar Publisher, Bengaluru, ISBN 978-93-85155-70-3, 2022
18. High Performance Metallic Materials for Cost Sensitive Applications, F. H. Froes, et al. John Wiley & Sons, 2010
19. Instrumental Methods of Analysis, Dr. K. R. Mahadik and Dr. L. Sathiyarayanan, Nirali Prakashan, 2020
20. Principles of Instrumental Analysis, Douglas A. Skoog, F. James Holler, Stanley R. Crouch, Seventh Edition, Cengage Learning, 2020
21. Polymer Science, V. R. Gowariker, N. V. Viswanathan, Jayadev, Sreedhar, Newage Int. Publishers, 4th Edition, 2021
22. Engineering Chemistry, P. C. Jain & Monica Jain, Dhanpat Rai Publication, 2015-16th Edition.
23. Nanostructured materials and nanotechnology, Hari Singh, Nalwa academic press, 1st Edition, 2002.
24. Nanotechnology Principles and Practices, Sulabha K. Kulkarni, Capital Publishing Company, 3rd Edition 2014
25. Principles of nanotechnology, Phanikumar, Scitech publications, 2nd Edition, 2010.
26. Chemistry for Engineering Students, B. S. Jai Prakash, R. Venugopal, Sivakumaraiah & Pushpalayengar, Subash Publications, 5th Edition, 2014

27. "Engineering Chemistry", O.G. Palanna, Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint, 2015.

28. Chemistry of Engineering materials, Malini S. K S Anantha Raju, CBS publishers Pvt Ltd.,

29. Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

Web links and Video Lectures(e-Resources):

- <http://libgen.rs/>
- <https://nptel.ac.in/downloads/122101001/>
- <https://nptel.ac.in/courses/104/103/104103019/>
- <https://ndl.iitkgp.ac.in/>
- <https://www.youtube.com/watch?v=faESCxAWR9k>
- <https://www.youtube.com/watch?v=TBqXMWaxZYM&list=PLyhmwFtznRhuz8L1bb3X-9IbHrDMjHWWWh>
- <https://www.youtube.com/watch?v=j5Hml6KN4TI>
- <https://www.youtube.com/watch?v=X9GHBdyYcyo>
- <https://www.youtube.com/watch?v=1xWBPZnEJk8>
- <https://www.youtube.com/watch?v=wRAo-M8xBHM>

Activity Based Learning (Suggested Activities in Class)/Practical Based learning

<https://www.vlab.co.in/broad-area-chemical-sciences>

<https://demonstrations.wolfram.com/topics.php>

<https://interestingengineering.com/science>

P. R. Suman


PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

Visvesvaraya Technological University, Belagavi

Scheme: 2022 (CBCS)

Stream: Computer Science and Engineering and allied branches

Course Title: Chemistry for Computer Science & Engineering stream

Semester I/II

Question Bank

Sub Code: BCHES102/202

NOTE: Question Bank is Prepared as per Blow-up of Syllabus

MODULE1: Sensors and Energy Systems			
Sl No	QUESTIONS	RBT Level	Marks
1	Define the following: Sensor, transducer and actuator.	L1	6
2	What are electrochemical sensors? Explain the principle and working of electrochemical sensors and mention the applications of electrochemical sensors.	L2	7
3	Discuss the principle, working and applications of conductometric sensors.	L2	7
4	Discuss the principle, working and applications of optical sensors.	L2	7
5	What are Electrochemical Sensors? Explain its application in the measurement of Dissolved Oxygen (DO)	L2	7
6	Explain the detection of pharmaceutical pollutant diclofenac using Electrochemical sensor with electro-oxidation reactions.	L2	7
7	Explain the detection of hydrocarbon pollutant 1-hydroxy pyrene using Electrochemical sensor with electro-oxidation reactions.	L2	7
8	Discuss the working principle of electrochemical gas sensors for the detection of SO _x and NO _x .	L3	6
9	What are disposable sensors? Mention the advantages of disposable sensors.	L1	6
10	Discuss the detection of a bio-molecule ascorbic acid using disposable sensor also write the electro oxidation reaction.	L2	7
11	Explain the detection of Herbicide-Glyphosate with reactions.	L2	6
12	Define a battery. Give the classification of batteries with examples.	L1	6
13	What is a secondary battery? Explain the construction and working of Li-Ion battery.	L2	7

14	What is a secondary battery? Explain the construction and working of Na-Ion battery.	L2	7
15	What is Quantum Dot Sensitized Solar Cell (QDSSC)? Explain the construction and working of QDSSC.	L2	7
16	Write the properties and applications of Quantum Dot Sensitized Solar Cell (QDSSC).	L1	6
MODULE-2 Materials for Memory and Display Systems			
1	What are Memory Devices? Explain the Classification of electronic memory devices with examples	L2	6
2	Explain the types of organic memory devices by taking p- type and n-type semiconducting materials.	L2	7
3	Define photoactive and electroactive materials and write their working principle in display system.	L2	7
4	What are nanomaterials? Explain any four properties and applications of Polythiophenes (P3HT) suitable for optoelectronic devices.	L2	7
5	What is QLED? Mention any four properties and applications of QLED.	L1	6
6	Explain the classification of liquid crystals. Mention any four properties and applications of liquid crystals.	L2	6
7	Discuss the working of Liquid Crystal Display.	L2	7
8	Explain any four properties and applications of Light emitting materials - Poly[9-vinylcarbazole] (PVK)] suitable for optoelectronic devices.	L2	7
9	Discuss the use of Polyimide Polymeric material for Organic memory device.	L2	7
10	Define Optoelectronic device. Explain the working principle of Optoelectronic device.	L2	6
11	Write the properties and applications of Silicon Nano Crystals for Optoelectronic devices	L2	6
12	What is OLED? Mention any four properties and applications of OLED.	L1	6
MODULE3:Corrosion and Electrode System			
1	Define metallic corrosion. Describe the electrochemical theory of corrosion taking iron as an example.	L2	6
2	Discuss the following types of Corrosion: a. Differential Metal Corrosion b. Differential aeration Corrosion	L2	6
3	What is cathodic protection? Describe sacrificial anode technique and mention the advantages and disadvantages.	L3	7

4	Define galvanizing. Describe galvanizing of Iron and mention its applications.	L2	7
5	What is anodizing of aluminium? Describe anodizing of Aluminium and mention its applications.	L2	6
6	What is CPR? A thick brass sheet of area 400 inch ² is exposed to moist air. After 2 years of period, it was found to experience a weight loss 375 g due to corrosion. If the density of brass is 8.73 g/cm ³ . Calculate CPR in mpy and mmpy.	L2	6
7	What are concentration cell? Explain the construction and working of concentration cell.	L2	6
8	What are reference electrodes? Explain the construction, working and application of Calomel electrode.	L2	7
9	Explain the construction and working of ion selective electrode and how it can be used for the determination of pH of a solution.	L2	7
10	Define concentration cell. Emf of the cell Ag/AgNO ₃ (0.001M) // AgNO ₃ (xM) /Ag is 0.0659 V at 298K. Write the cell representation, cell reactions and calculate the value of x.	L2	7
11	Briefly explain the principle, instrumentation and working of potentiometry taking estimation of Iron as example.	L2	6
12	Explain the principle, instrumentation and working of conductometry taking estimation of weak acid using a strong base as an example.	L2	6

MODULE 4: Polymers and Green Fuels

1	Define number average and weight average molecular weight. A polydisperse sample of polystyrene is prepared by mixing three monodisperse samples in the following proportions. 1g of 10000 molecular weight, 2g of 50000 molecular weight and 2g of 100000 molecular weight. Determine number average and weight average molecular weight. Find the index of polydispersity.	L2	7
2	Discuss the conduction mechanism in Polyacetylene through oxidative and reductive doping technique.	L3	7
3	Explain the preparation, properties, and commercial applications of graphene oxide.	L2	7
4	Explain the preparation, properties, and commercial applications of Kevlar.		7
5	Explain the construction and working of photovoltaic cells. Mention the advantages and disadvantages.	L2	7
5	What is Green Fuel (Hydrogen fuel)? Mention the advantages of green fuel.	L1	6

6	Describe the generation of hydrogen by Alkaline water electrolysis with a neat labelled diagram.	L2	6
7	Explain the generation of hydrogen by proton exchange membrane electrolysis.	L2	6
8	In a sample of a polymer, 20% molecules have molecular mass 15000 g/mol, 35% molecules have molecular mass 25000 g/mol, and remaining molecules have molecular mass 20000 g/mol, calculate the number average and weight average molecular mass of the polymer, Calculate PDI and comment on it.	L2	6
9	Illustrate with a neat labelled diagram the production of Hydrogen by using solid oxide electrolyzer.	L2	6
MODULE 5: E-Waste Management			
1	Define E-Waste. Explain the sources and composition of e-waste.	L2	6
2	Mention the sources of e-waste and explain the need for e-waste management	L2	7
3	Briefly discuss the various steps involved in recycling of e-waste. (all the three STEPS)	L3	7
4	Explain the steps involved in extraction of gold from e-waste.	L2	7
5	Explain the ill effects of toxic materials used in manufacturing electrical and electronic products.	L2	6
6	Discuss the following: (i) Pyrometallurgy (ii) Hydrometallurgy	L2	7
7	Write a brief note on role of stakeholders for example; producers, consumers, recyclers, and statutory bodies.	L3	6
8	What is e-waste? Explain the characteristics of E-Waste.	L2	6
9	Briefly explain direct recycling of e-waste.	L2	6

CITY ENGINEERING COLLEGE

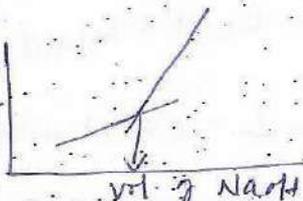
DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
b.	<p>Fig. + Expt. + formula.</p> $E_{cell} = E_A - E_{SCE}$ $E_{cell} = L_1 - 0.0591 pH - E_{SCE}$ $pH = \frac{L_1 - E_{SCE} - E_{cell}}{0.0591}$	2+1+2	5M
3.	<p>Fig. + Expt. + Analyte + titrant. conductivity cell.</p> <p><u>Application:-</u></p>  <p>Weak acid: & Strong base</p> $CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$	1+1+1+1+1	5M
	<p>Graph + Reaction + Expt.</p>	1+1+3	5M
4. a.	$E_{cell} = \frac{2.303 RT}{nF} \log \left(\frac{C_2}{C_1} \right)$ $0.0659 = \frac{2.303 \times 8.314 \times 298}{1 \times 96500} \log \left(\frac{x}{0.001} \right)$	1M	
	$0.0659 = \frac{2.303 \times 8.314 \times 298}{1 \times 96500} \log \left(\frac{x}{0.001} \right)$	1M	5M

Staff

$$6359.35 = 5705.848 \log x - (-3)$$

$$1.1145 = \log x + 3$$

$$1.1145 - 3 = \log x$$

$$-1.8855 = \log x$$

$$x = 0.0130 M$$

1M HOD

2M

CITY ENGINEERING COLLEGE
DEPARTMENT OF Chemistry

SCHEME FOR VALUATION

Internal Test I

Semester & Section: I, D, E, F

Date: 2/2/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
1.	<p>Fig. + Expl. + Composition $\text{Na}_2\text{O} - 22\%$ $\text{SiO}_2 - 72\%$ $\text{CaO} - 6\%$</p> <p>working: $- E_b = E_1 - E_2$</p> $E_b = \frac{RT}{F} \ln c_2 - \frac{RT}{F} \ln c_1$ $E_b = -\frac{RT}{F} \ln c_1 + \frac{RT}{F} \ln c_2$ $E_b = L + 0.0591 \log [H^+]$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $E_b = L - 0.0591 \text{ pH}$ </div> $E_a = E_b + E_{\text{As/Asd}} + E_{\text{Asym}}$ $= L - 0.0591 + E_{\text{As/Asd}} + E_{\text{Asym}}$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $E_a = L_1 - 0.0591 \text{ pH}$ </div>	<p>1+1+1</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p>	<p>3M</p> <p>5M</p> <p>2M</p>
2. a.	<p>Fig. + Expl. + reactions + EMF</p> <p>Anode: $2\text{Hg} + 2\text{Cl}^- \longrightarrow \text{Hg}_2\text{Cl}_2 + 2e^-$</p> <p>Cathode: $\text{Hg}_2\text{Cl}_2 + 2e^- \longrightarrow 2\text{Hg} + 2\text{Cl}^-$</p> $E = E^\circ - 0.0591 \log [Cl^-]$	<p>1+1+2+1</p>	<p>5M</p>

Staff

S. P. D. Srinivasan
HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF Chemistry

SCHEME FOR VALUATION

Internal Test I

Semester & Section: I, D, E, F

Date: 2/02/23

Question No.	Details of the answer	Marks Distribution	Total Marks
b.	Fig. + Expt.	1+4	5M.
5.	Expt. + Reactions	5+5	10M.
6. a.	$\bar{M}_n = \frac{N_1 M_1 + N_2 M_2 + N_3 M_3}{N_1 + N_2 + N_3}$ $= \frac{(30 \times 2000) + (100 \times 2500) + (200 \times 3000)}{30 + 100 + 200}$ $= 2757.5$	2M.	5M
	$\bar{M}_w = \frac{N_1 M_1^2 + N_2 M_2^2 + N_3 M_3^2}{N_1 M_1 + N_2 M_2 + N_3 M_3}$ $= \frac{(30 \times 2000^2) + (100 \times 2500^2) + (200 \times 3000^2)}{910000}$ $= 2796.70$	3M	
b.	Fig. + Expt.	1+4	5M
7. a.	$\frac{KXW}{PAT} = \frac{534 \times 375 \times 1000}{7.9 \times 62 \times 365 \times 24} = 46.67 \text{ mpy}$	3M	5M
	$CPR = \frac{87.6 \times 375 \times 1000}{7.9 \times 400 \times 365 \times 24} = 1.186 \text{ mmy}$	2M	
b.	Fig. + Expt.	3+4	5M.
8.	Synthesis + Conduction Mech.	2+8	10M.

Staff


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061


 HOD

P. P. Suman

USN

I	C	E							
---	---	---	--	--	--	--	--	--	--

CITY ENGINEERING COLLEGE
II Internal Test

Course:- Applied Chemistry for CS BCHES102/202
Programme:- CS
Sem & Sec:- I & D,E & F

Date:- 02/03/2023
Time:-10.30-12.00 P.M
Max.Marks-40

Q.No.	ANSWER ALL QUESTIONS	MAR KS	CO' S	BT Lev -el
PART-A				
1.	Explain principle, properties and application of Quantum dot sensitized solar cell?	10	CO1	BT1
OR				
2.a)	Explain construction, working and applications of Li-ion battery?	5	CO1	BT3
b)	Explain construction, working and applications of Na-ion battery?	5	CO1	BT3
PART-B				
3.	Explain generation of H ₂ by alkaline water electrolysis?	10	CO4	BT2
OR				
4.a)	Explain construction, working of solar photovoltaic cell?	5	CO4	BT3
b)	Explain working, principle and applications of conductometric sensor?	5	CO1	BT2
PART-C				
5.	Explain detection of Dissolved oxygen using electrochemical sensor?	10	CO1	BT2
OR				
6.a)	Explain working, principle and applications of optical sensor?	5	CO1	BT3
b)	Explain working, principle and applications of thermometric sensor?	5	CO1	BT2
PART-D				
7. a)	Explain electrochemical sensor for detection of pharmaceutical drug diclofenac?	6	CO1	BT3
b)	Explain working, principle and applications of electrochemical sensor?	4	CO1	BT3
OR				
8.	Explain generation of H ₂ by polymer electrolyte membrane water electrolysis?	10	CO4	BT1

Course outcomes:-

CO3--- Solve for the problems in chemistry that are pertinent in engineering applications.

CO4--- Apply the basic concepts of chemistry to explain the chemical properties and processes.

Blooms Taxonomy:-

BT1---Knowledge BT2---Understand BT3---Apply BT5----Evaluate.


PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 051

CITY ENGINEERING COLLEGE

DEPARTMENT OF

SCHEME FOR VALUATION

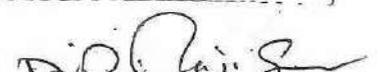
Internal Test

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
3.	Construction + Reactions + Fig. $2H_2O + 2e^- \longrightarrow H_2 + 2OH^-$ $2OH^- \longrightarrow \frac{1}{2}O_2 + H_2O + 2e^-$ <hr/> $H_2O \longrightarrow H_2 + \frac{1}{2}O_2$	5+4+1	10M
4. a.	Def. + Expl. + Fig.	1+2+2	5M
b.	Fig. + Expl. + Applications	1+3+2	5M
5.	components + Reactions + Fig. A:- $Pb \longrightarrow Pb^{2+} + 2e^-$ C:- $\frac{1}{2}O_2 + 2e^- + H_2O \longrightarrow 2OH^-$ <hr/> $Pb + \frac{1}{2}O_2 + H_2O \longrightarrow Pb(OH)_2$	4+4+2	10M
6. a.	Expl. + Applications + Fig.	1+3+1	5M
b.	Expl. + Applications.	3+2	5M
7.	components + Expl. + Reaction.	2+2+2	6M


Staff


HOD

CITY ENGINEERING COLLEGE
DEPARTMENT OF Chemistry

Scheme for Valuation

Internal Test II

Semester & Section: I, D, E & F

Date: 2/03/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
1.	<p>Components, Figure + Reactions + Expl.</p> <p><u>Excitation</u> $\text{CdS} + h\nu \longrightarrow \text{CdS}^*$</p> <p><u>Exciton Dissociation</u> :- $\text{CdS}^* \longrightarrow e^{-*} + h^{+*}$</p> <p><u>Injection</u> :- $\text{CdS}^* + \text{TiO}_2 \longrightarrow \text{TiO}_2^*(e^-) + \text{CdS}^+$</p> <p><u>Energy generation</u> :- $\text{TiO}_2^*(e^-) + \text{CE} \longrightarrow \text{TiO}_2 + e^{-*} +$ electronic current</p>	3+2+4 +1	10M
2. a.	<p><u>Li-ion Battery</u> :- Construction + Reactions + Fig.</p> <p>$\text{Li-C}_6 \rightleftharpoons \text{Li}^+ + 1e^- + \text{C}$</p> <p>$\text{Li}^+ + 1e^- + \text{CoO}_2 \rightleftharpoons \text{Li-CoO}_2$</p>	2+2+1	5M
b.	<p>$\text{Li-C}_6 + \text{CoO}_2 \rightleftharpoons \text{Li-CoO}_2 + \text{C}$</p> <p>Construction + Reactions + Fig.</p> <p>$\text{C-Na} \rightleftharpoons \text{C} + \text{Na}^+ + 1e^-$</p> <p>$\text{Na}^+ + 1e^- + \text{CoO}_2 \rightleftharpoons \text{NaCoO}_2$</p> <p>$\text{C-Na} + \text{CoO}_2 \rightleftharpoons \text{NaCoO}_2 + \text{C}$</p>	2+2+1	5M

Staff

Dr. D. S. Rao

CITY ENGINEERING COLLEGE

DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
b.	Fig. + Expt. + applications	1+2+1.	4M
8.	Components + Reactions + Fig. $A:- H_2O \longrightarrow \frac{1}{2}O_2 + 2H^+ + 2e^-$ $C:- 2H^+ + 2e^- \longrightarrow H_2$ <hr/> $H_2O \longrightarrow \frac{1}{2}O_2 + H_2$	5+4+1	10M

Staff


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061


 HOD

USN

1	C	E							
---	---	---	--	--	--	--	--	--	--



CITY ENGINEERING COLLEGE

III Internal Test

Course:- Applied Chemistry for CS BCHES102/202

Date:- 05/04/2023

Programme:- CS

Time:-10.30-12.00 P.M

Sem & Sec:- I & D,E & F

Max.Marks-40

Q.No.	ANSWER ALL QUESTIONS	MAR KS	CO' S	BT Lev -el
-------	----------------------	-----------	----------	------------------

PART-A

1.	Discuss the working principle of Liquid crystal Display?	10	CO2	BT1
----	--	----	-----	-----

OR

2.a)	Mention the source of e-waste and explain the need for e-waste management?	5	CO5	BT2
b)	What is e-waste? Explain the characteristics of e-waste?	5	CO5	BT2

PART-B

3.	Explain the working principle of optoelectronic device and explain properties and applications of PVK for optoelectronic devices?	10	CO2	BT3
----	---	----	-----	-----

OR

4.a)	Explain direct recycling of e-waste?	5	CO5	BT3
b)	Explain the steps involved in the extraction of gold from e-waste?	5	CO5	BT3

PART-C

5.	Write a note on Optoelectronic devices a) Silicon nano crystal b) P3HT?	10	CO2	BT2
----	---	----	-----	-----

OR

6.a)	Explain about pyrometallurgical method?	5	CO5	BT2
b)	Mention the sources of e-waste and explain the need for e-waste management?	5	CO5	BT1

PART-D

7.a)	Explain properties and application of QLED?	5	CO2	BT2
b)	Explain properties and application of LEC?	5	CO2	BT2

OR

8.	Write a note on role of stakeholders like producers, consumers, recyclers and statutory bodies?	10	CO5	BT1
----	---	----	-----	-----

Course outcomes:-

CO2--- Phenomena of chemistry to describe the methods of engineering processes

CO5— Analyze properties and multi processes associated with chemical substances in disciplinary situations

Blooms Taxonomy:-

BT1—Knowledge BT2---Understand BT3---Apply.


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE

DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
4. a.	Recycling of e-waste (Expl.)	5	10 M.
b.	Extraction of Au. (Expl.)	5	
5.	Silicon Nano crystal + P3HT	5+5	10 M.
6. a.	Expl.	5+5	10 M.
b.	Expl.		
7. a.	Expl. Properties + Applications	5+5	10 M.
b.	Properties + Applications		
8.	Expl. for Producers, Consumers, recyclers, statutory bodies.	10 M.	10 M.

Staff

HOD

CITY ENGINEERING COLLEGE

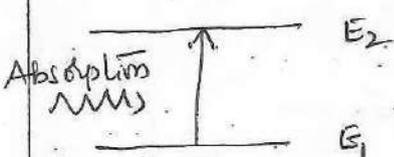
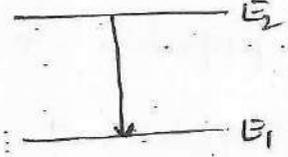
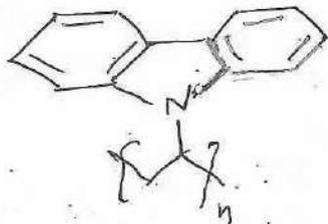
DEPARTMENT OF Chemistry

SCHEME FOR VALUATION

Internal Test III

Semester & Section: 01, D, E, F

Date: 5/4/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
1.	Fig. + - Expt.	3+7	10M.
2.	a. Expt.	5 } 5 }	10M
	b. Def. + Characteristics of e-waste		
3.	working principle of optoelectronic device.		
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Absorption</p> </div> <div style="text-align: center;">  </div> </div> <p>Photon energy more than Band gap absorption of light occurs and its excitation occurs.</p> <p>If e jumps from higher energy state to lower energy state emission of light occurs.</p> <p><u>App:</u> 1. Used in OLED</p> <p>2. Used in light emitting diodes, probes</p> <p>3. Used in construction of solar cell with Perovskite materials.</p>	5	10M
	<p><u>PVK</u></p> 		

Staff


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061


 HOD

Year : 2022 - 20 23

Semester : Odd / Even ✓

Name of the Teacher : Dr. Sunitha - N

Designation : Assoc Prof

Department : Chemistry

Sem/Branch	Subject Code	Subject
1. I / CS	22CHES12	Applied Chemistry for computer science & Engg. streams.
2.		
3.		

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	AS	AS	AS	AS
HOD	AS	AS	AS	AS
Principal				

ATTENDANCE

Sl. No.	Reg. No.	Name	ERP	Date										
				14/11	15/11	16/11	17/11	18/11	19/11	20/11	21/11	22/11	23/11	24/11
1	ICE22CS001	Aaryan Sahu	2301	1	2	3	4	5	6	7	8	9	10	11
2	02	Abhiramdan Rafendra Havannavar ⁰²		1	2	3	4	5	5	6	7	8	9	10
3	03	Abhishek. K.		1	2	3	4	5	6	7	8	9	10	11
4	04	Abhishek kumar		1	2	2	3	4	5	5	6	7	8	9
5	05	Abhishek M.K		1	2	3	4	5	5	6	7	8	8	9
6	06	Abhishek . S. Guler		1	2	2	3	4	5	6	7	8	9	10
7	07	Adarsha	601	1	2	3	4	5	6	7	7	8	9	10
8	08	Aditya kumar		1	2	3	4	5	6	7	8	9	10	11
9	09	Aishwarya. k. H		1	2	3	4	5	6	7	8	9	10	11
10	10	Amithi .D. chavan		1	2	3	4	5	6	7	8	9	10	10
11	11	Amrutha . R. K		1	2	3	4	5	6	6	7	8	9	10
12	12	Aneesha . S		1	2	3	4	5	6	7	7	8	9	10
13	13	Anjali Mallikarjun		1	2	3	4	5	6	7	8	9	10	11
14	14	Anusha . A		1	2	3	4	5	6	7	8	9	10	11
15	15	Anusha . B. T		1	2	3	4	5	6	7	8	9	10	10
16	17	Aravind Shrimanthi Chawan		1	2	3	4	5	5	6	7	8	9	10
17	19	Arpitha . A		1	2	3	4	5	6	7	8	8	9	10
18	18	Arpitha . M		1	2	2	3	4	5	6	7	8	9	10
19	20	Arun kumar . S		1	2	3	4	5	6	7	8	9	10	
20	21	Ashik . K. Shetty		1	2	3	4	5	6	7	8	9	10	11
21	22	Ashritha . S		1	2	3	4	5	6	7	8	9	10	11
22	23	B. Prasanna Bakale		1	2	3	4	5	6	7	8	9	10	11
23	24	B. S. Akshatha		1	2	3	4	5	5	6	6	7	8	9
24	25	Balaji Patil		1	2	3	4	5	6	7	8	9	9	10
25	26	Banupriya . B		1	2	3	4	5	6	7	8	9	10	11
No. of Absents														
Initials														

LESSON PLAN

Week	Date		Topics Planned
	From	To	
I	14/12/22	17/12/22	<u>Sensors</u> :- Introduction:- Working, principle and applications of conductometric sensors, electrochemical sensors, thermometric sensors and optical sensors. Sensors for the measurement of DO, Electrochemical sensors for pharmaceuticals, Electrochemical gas sensors for SO_2 & NO_2 , Disposable sensors for pesticides.
II	19/12/22	24/12/22	<u>Energy system</u> :- Construction, working, applications of Li-ion, sodium ion battery, OLED - principle.
III	26/12/22	30/12/22	<u>Module - 2</u> :- Memory devices:- Introduction, Basic concepts of electronic memory, history of organic polymer memory devices, classification of electronic
IV	2/1/23	7/1/23	devices, types of organic memory devices, <u>Display systems</u> :- Photoactive & electroactive materials, organic & Nano materials used in optoelectronic devices,
V	9/1/23	13/1/23	LED, application, Organic light emitting diode and Quantum light emitting diodes (QLEDs) light emitting electrochemical cells.
VI	16/1/23	21/1/23	<u>Module-3</u> :- Introduction, electrochemical theory of corrosion, types of corrosion, differential metal & differential aeration. Galvanization,
VII	22/1/23	28/1/23	anodization, sacrificial anode method. Corrosion penetration Rate (CPR) - Problems.
VIII	1/2/23	4/2/23	<u>Electrode system</u> :- Types of electrodes, Ion selective electrode, construction, working and applications of Glass electrode. Determination of pH using glass electrode.

LESSON PLAN

Week	Date		Topics Planned
	From	To	
IX	6/2/23	11/2/23	Reference electrode:- calomel electrode, construction & working of calomel electrode, concentration cell construction, working and problems.
X	13/2/23	18/2/23	<u>Analytical techniques</u> : Principles, instrumentation of conductimetry, application in the estimation of weak acid. potentiometry, application in Ferrous
XI	20/2/23	25/2/23	<u>Module-4</u> Polymers: Introduction, Molecular wt., No. Avg. Weight - Problems. Preparation Properties and applications of Kevlar.
XII	2/3/23	5/3/23	Conducting polymers = synthesis & conducting mechanism of Polyacetylene. and its application <u>Green fuel</u> : Introduction, construction, working of
XIII	6/3/23	11/3/23	solar photovoltaic cell, advantages and disadvantages. Generation of green H ₂ by electrolysis of water and Polymer membrane elect. cell.
XIV	13/3/23	18/3/23	<u>Module-5</u> : Introduction, sources of e-waste composition, characteristic and need of e-waste management. Toxic materials used in
XV	20/3/23	25/3/23	manufacturing electronic & electrical products, health hazards due to exposure to e-waste. Recycling :- separation, thermal treatments,
XVI	27/3/23	31/3/23	hydrometallurgical extraction, Pyrometallurgical, direct recycling. Extraction of gold from e-waste Role of stakeholders in environmental management of e-waste (Producers, consumers, recyclers & regulatory bodies)

.....
Teacher's Signature

.....
HOD'S Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
14/12	1 st Hr.	Introduction to Electrode systems
19/12	4 th Hr.	Construction & working of calomel electrode.
20/12	1 st	Construction & working of concentration cell.
21/12	1 st	Problems on conc. cell
26/12	4 th	Construction & working of glass electrode.
		Determination of pH using glass electrode & problems on conc. cell.
28/12		Problems on conc. cell.
31/12	2 nd	Test on construction working of glass electrode
2/1	4 th	Theory, Instrumentation of conductometry
4/1	1 st	Applications of conductometry
7/1	2 nd	Theory, Instrumentation of potentiometry, applications
9/1	4 th	Polymers:- No. Avg. Molecular Mass, weight-Avg. molecular mass & problems on it.
11/1	1 st	Conduction Mech. in polyelectrolyte
16/1	4 th	Graphene oxide Properties, appli, synthesis
20/1	2 nd	Application of Polyacetylene.
21/1	2 nd	Kevlar, Alkaline water electrolysis.
23/1	4 th	Polymer electrolyte membrane electrolysis
24/1	2 nd	Photovoltaic cell construction, working
25/1	1 st	Construction & working of Li-ion battery.
30/1	4 th	Construction & working of Na-ion battery.
8/2	1 st	ADSSC construction, working
10/2	2 nd	Test on Li-ion battery

.....

 Teacher's Signature

.....

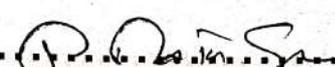
 HOD'S Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
13/2	4th	Conductometric sensor
14/2	2nd	Electrochemical sensor.
15/2	1st	Optical sensor.
12/2	2nd	Thermometric sensor.
20/2	4th	Electrochemical sensor for DO
24/2	2nd	Electrochemical sensor for NO_x & SO_x
27/2	4th	Disposable sensor for ascorbic acid
7/3	2nd	Disposable sensor for pesticide Glyphosate
8/3	1st	Optical devices, P3HT, Nanomaterials.
15/3	1st	Classification of liquid crystal, source of e-waste
17/3	2nd	Nematic, smectic, cholesteric, Characteristics of e-waste
18/3	2nd	Applications of LCD, Hydrometallurgical, Pyrometallurgical.
24/3	2nd	OLED, QLED, LEC, direct recycling.
25/3	2nd	Substrate, electroactive materials, PVK.
29/3	1st	Extraction of 'Au' from e-waste,
31/3	2nd	Role of stakeholders, producers, consumers, recyclers, statutory bodies in e-waste management

.....

Teacher's Signature

.....

HOD'S Signature

DEPARTMENT OF CIVIL ENGINEERING

CIRCULAR

Ref No: CEC/CV/DAC/ACY 2022-2023/02

Date: 08-02-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 08-02-2023 at 10: 00 AM in CV department.

Agenda:

- Planning of Internships, Project work & Technical Seminar for 8th semester students.
- Involving students in technical activities.
- Planning of AICTE activity report for 8th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning of Course preference, Course allocation & Work load distribution for upcoming even semester.



Dr. Thippeswamy H N

HOD

DEPARTMENT OF CIVIL ENGINEERING

Department Advisory Committee Meeting

Date: 08/02/2023

Time: 10:00 AM

Venue: CV Department

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Dr. H N THIPPESWAMY	HOD	Convenor
2	Mr. MAHESH KUMAR M C	Assistant Professor	Member
3	Mr. GURUPRASAD N	Assistant Professor	Member
4	Mr. VINAYKUMAR S N	Assistant Professor	Co-Convenor
5	Mr. NISHANTH KUMAR	Assistant Professor	Member
6	Mr. JAYANTH K S	Assistant Professor	Member
7	Mr. MANJUNATH K E	Assistant Professor	Member
8	Mr. ANANTHASWAMY M R	Senior Technical Manager, PropEdge Valuation Pvt. Ltd	Alumni (Industry Expert)
9	Mr. Hari prasad S	V J Construction, Senior Engineer	Alumni

The Department Advisory Committee meeting was conducted at Department of CV, on 8th February, 2023, at 10 AM.

Agenda of the Meeting:

- Planning of Internships, Project work & Technical Seminar for 8th semester students.
- Involving students in technical activities.
- Planning of AICTE activity report for 8th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning of Course preference, Course allocation & Work load distribution for upcoming even semester.

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The HOD welcomed all the staff for the meeting. The following points were discussed as follows.

- Committee members suggested establishing MOUs with various Construction & Building valuation industries to provide students with internship & project work opportunities.
- It was proposed to conduct a workshop, seminars & guest lecture on recent trending topics.
- The staff members were informed to conduct classes and labs regularly, to timely conduct and complete the entrusted responsibility, to actively participate in the dept and college activities and finally to take suitable actions for getting results and admissions to the dept.
- The guide has to check and discuss about the internship practice taken by students allocated to him or she.
- The staff members should complete all the five modules and work hard to get 100% pass percentage. The staff members should find out the reasons for poor percentage in the concerned subject and submit report.

HOD thanked all the staff for having attended the meeting.



Dr. Thippeswamy H N

HOD



CITY
ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

CLASS ROOM: C309

8th Semester (2018 SCHEME)

CLASS TEACHER: Prof. MANJUNATH K E

W. E. F. – 13th Feb 2023

DAY	9:00 to 10:00	10:00 to 11:00		11:15 to 12: 15	12:15 to 1:15		2:00 to 3:00	3:00 TO 4:00	4:00 to 5:00
	I	II		III	IV		V	VI	VII
MON	18CV824	18CV824	B R E A K	18CV81	18CV81	B R E A K	Internship/Professional Practice		
TUE	18CV81	18CV81		18CV824	LIBRARY		Internship/Professional Practice		
WED	PROJECT WORK			PROJECT WORK			SEMINAR		
THR	PROJECT WORK			PROJECT WORK			SEMINAR		
FRI	PROJECT WORK			PROJECT WORK			LIBRARY		
SAT	LIBRARY			LIBRARY					

18CV81 DESIGN OF PRE-STRESSED CONCRETE
 18CV824 REHABILITATION & RETROFITTING
 18CVP83 PROJECT WORK PHASE-II
 18CVS84 TECHNICAL SEMINAR
 18CVI85 INTERNSHIP

Prof. Manjunath K. E./Prof. Guruprasad
 Prof. Vinaykumar S N/Prof. Jayanth K S
 Prof. Manjunath K. E./Prof. Mahesh kumar
 Prof. Vinaykumar S N/Jayanth K S
 Prof. Vinaykumar S N/Prof. Nishanth kumar

Manjunath K E

HOD

HOD, CIVIL ENGG DEPT.
 CITY ENGINEERING COLLEGE
 Doddakallasandra,
 BANGALORE - 560 062

Skandan

PRINCIPAL

Principal
 City Engineering College,
 Bangalore-560 061

DEPARTMENT OF CIVIL ENGINEERING
COURSE PREFERENCE
EVEN SEM

Name of the Faculty: Dr. H N THIPPESWAMY

Designation: Professor & HOD

Sl. No	Course Code and Name	Year/Semester
1	18CVP83 - Project Work Phase - 2	4 th /8 th
2	18CVS84 - Technical Seminar	4 th /8 th
3	18CVI85 - Internship	4 th /8 th


Signature of Faculty

Name of the Faculty: Mr. MAHESH KUMAR M C

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CVP83 - Project Work Phase - 2	4 th /8 th
2	18CVS84 - Technical Seminar	4 th /8 th


Signature of Faculty

Name of the Faculty: Mr. GURUPRASAD N

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV81 - Design of Pre-stressed Concrete	4 th /8 th
2	18CV822 - Prefabricated Structures	4 th /8 th


Signature of Faculty

Name of the Faculty: Mr. VINAYKUMAR S N

Designation: Assistant Professor

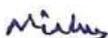
Sl. No	Course Code and Name	Year/Semester
1	18CV824 - Rehabilitation & Retrofitting	4 th /8 th
2	18CVS84 - Technical Seminar	4 th /8 th
3	18CVI85 - Internship	4 th /8 th


Signature of Faculty

Name of the Faculty: Mr. NISHANTH KUMAR

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV825 - Pavement Design	4 th /8 th
2	18CVI85 - Internship	4 th /8 th


Signature of Faculty

Name of the Faculty: Mr. JAYANTH K S

Designation: Assistant Professor

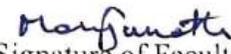
Sl. No	Course Code and Name	Year/Semester
1	18CV824 - Rehabilitation & Retrofitting	4 th /8 th
2	18CV825 - Pavement Design	4 th /8 th


Signature of Faculty

Name of the Faculty: Mr. MANJUNATH K E

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV81 - Design of Pre-stressed Concrete	4 th /8 th
2	18CV822 - Prefabricated Structures	4 th /8 th


Signature of Faculty

ACADEMIC YEAR: 2022-23 (EVEN)

DEPARTMENT OF CIVIL ENGINEERING

COURSE ALLOCATION

EVEN SEM

Sl. No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr. H N THIPPESWAMY	18CVP83 - Project Work Phase - 2	4 th /8 th	
2	Mr. MAHESH KUMAR M C	18CVP83 - Project Work Phase - 2	4 th /8 th	
3	Mr. GURUPRASAD N	18CV81 - Design of Pre-stressed Concrete	4 th /8 th	
4	Mr. VINAYKUMAR S N	18CV824 - Rehabilitation & Retrofitting 18CVS84 - Technical Seminar 18CVI85 - Internship	4 th /8 th 4 th /8 th 4 th /8 th	
5	Mr. NISHANTH KUMAR	18CVI85 - Internship	4 th /8 th	
6	Mr. JAYANTH K S	18CV824 - Rehabilitation & Retrofitting 18CVS84 - Technical Seminar	4 th /8 th 4 th /8 th	
7	Mr. MANJUNATH K E	18CV81 - Design of Pre-stressed Concrete 18CVP83 - Project Work Phase - 2	4 th /8 th 4 th /8 th	


HOD

CITY ENGINEERING COLLEGE

Doddakallasandra, Kanakapura Road, Bangalore - 560061



FACULTY ACADEMIC FILE

Name : Manjunath K.E/Guruprasad
Designation : Assistant Professor
VTU Id : ICEN0014497
Academic Year : 2022-23
Department : Civil Engineering
Branch : Civil Engineering
Semester : 8th
Section : 'A'
Subject Code : 18CV81
Subject Name : Design of PSC

M.K.E.
Staff Signature

[Signature]
HOD
HOD, CIVIL ENGG DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

[Signature]
Principal



CITY
ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

DAY	9:00 to 10:00	10:00 to 11:00		11:15 to 12:15	12:15 to 1:15		2:00 to 3:00	3:00 TO 4:00	4:00 to 5:00	
	I	II		III	IV		V	VI	VII	
MON			B R E A K	18CV81	18CV81	B R E A K	Internship/Professional Practice			
TUE	18CV81	18CV81						Internship/Professional Practice		
WED										
THR										
FRI										
SAT										

MjH

[Signature]
HOD, CIVIL
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062.



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (ODD SEMI) & EVEN SEMI

DAY	Feb 2023		March 2023		April 2023		May 2023	
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
WED	1	1st Sem -I CIE	1	1st Sem -II CIE				
THU	2		2					
FRI	3		3					
SAT	4		4					
SUN	5		5		1	III SEM LAST WORKING DAY III test DIP		
MON	6		6	I test -DIP	2			
TUE	7		7	I test-DIP	3	III test DIP & II test -8thsem 1st sem practical exam	1	KARMIKARA DINACHARANE
WED	8		8	Women's day	4	3 rd sem practical exam	2	
THU	9	5 th sem practical ends	9		5		3	
FRI	10	Talents day	10		6		4	
SAT	11	2 nd Saturday holiday	11	2 nd Saturday holiday	7	GOOD FRIDAY	5	
SUN	12		12		8	2 nd Saturday holiday	6	2 nd Saturday holiday
MON	13	8 th sem commencement	13	I test 8 th Sem	9		7	
TUE	14		14		10		8	III test-8 th sem
WED	15		15	3 rd sem-III CIE & II test	11		9	
THU	16	5 th sem theory exam starts	16	3 rd sem-III CIE & II test	12		10	
FRI	17		17	3 rd sem-III CIE & II test	13		11	
SAT	18	MAHA SHIVARATHRI	18	5 th sem theory exam ends	14	Dr. B. R. AMBEDKAR JAYANTI	12	
SUN	19		19		15		13	
MON	20		20	6 th semester commencement	16		14	
TUE	21		21		17	I 1st & 3rd sem theory Examination	15	Commencement of II/IV SEM
WED	22		22	CHANDRAMANA UGADI	18		16	
THU	23		23		19		17	
FRI	24		24		20		18	
SAT	25	4 th Saturday holiday	25	4 th Saturday holiday	21		19	
SUN	26		26		22	Alumni day	20	4 th Saturday holiday
MON	27		27		23		21	
TUE	28		28	1st sem -III CIE	24		22	
WED			29		25		23	
THU			30		26		24	
FRI			31	I SEM LAST WORKING DAY- COLLEGE DAY	27		25	
SAT					28		26	
SUN					29		27	
MON					30		28	
TUE								
WED								

MjH

HOD. CIVIL ENG 29 DEPT.
CITY ENGINEERING COLLEGE
BANGALORE - 560 062.



ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

(ವಿ.ಟಿ.ಯು ಅಧಿನಿಯಮ ೧೯೯೪ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"JnanaSangama" Belagavi-590018, Karnataka, India

Prof. Dr. B. E. Rangaswamy, Ph.D.
REGISTRAR

Phone: (0831) 2498100
Fax : (0831) 2405467

REF: VTU/BGM/ACA/2022-23/ 6566

DATE: 3 FEB 2023

NOTIFICATION

Subject: Tentative Academic Calendar of VIII semesters of B.E./ B.Tech.,
B.Arch., B. Plan programs of University regarding...
Reference: Hon'ble Vice-Chancellor's approval dated: 03.02.2023

The tentative academic calendar concerned to VIII semesters of B.E./B.Tech.,
B. Arch., and B. Plan programs of University for academic year 2022-23 are hereby
notified as mentioned below;

(Tentative) Academic Calendar for semesters of all VIII Semester UG Programs (Feb 2023)			
	B.E./B.Tech.	B.Arch	B.Plan
Commencement of 8 th semester Classes	13.02.2023	13.02.2023	13.02.2023
Last Working day of 8 th Semester	13.05.2023	13.05.2023	13.05.2023
Practical Examination/Viva Examination	05.06.2023 To 13.06.2023	16.05.2023 To 26.05.2023	-----
Theory Examinations	16.05.2023 To 01.06.2023	29.05.2023 To 10.06.2023	16.05.2023 To 01.06.2023
Commencement of next Semester	---	-----	-----

Please Note:

- The academic sessions for VIII semester should commence on the date mentioned above.
- The Institute needs to function for six days a week with Saturday being half working day. #if required, the college can also plan to have extra classes on Saturday afternoons and Sundays full day to complete academic activities within the duration mentioned. This will facilitate the final year students for appearing competitive examination for their career and also helps in seeking admission abroad.



CITY
ENGINEERING COLLEGE

DEPT. OF CIVIL ENGINEERING

8TH SEMESTER 2022-23 STUDENTS LIST

SI No	USN	Student Name
1	1CE17CV030	SHAKUNTHALA C M
2	1CE19CV001	APOORVA C
3	1CE19CV003	RAVITEJA S
4	1CE19CV004	VEENA G
5	1CE20CV400	RAJASHEKAR PRASAD V

Mjkl

HOD, CIVIL ENGINEERING DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062.

B. E. CIVIL ENGINEERING
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)
SEMESTER - VIII

DESIGN OF PRE-STRESSED CONCRETE

Course Code	18CV81	CIE Marks	40
Teaching Hours/Week(L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives: This course will enable students to learn Design of Pre Stressed Concrete Elements.

Module -1

Introduction and Analysis of Members: Concept of Pre stressing - Types of Pre stressing - Advantages - Limitations -Pre stressing systems - Anchoring devices - Materials - Mechanical Properties of high strength concrete - high strength steel - Stress-Strain curve for High strength concrete.
 Analysis of members at transfer - Stress concept - Comparison of behavior of reinforced concrete – pre stressed concrete - Force concept - Load balancing concept - Kern point -Pressure line.

Module -2

Losses in Pre stress: Loss of Pre stress due to Elastic shortening, Friction, Anchorage slip, Creep of concrete, Shrinkage of concrete and Relaxation of steel - Total Loss.
 Deflection and Crack Width Calculations of Deflection due to gravity loads - Deflection due to prestressing force -Total deflection - Limits of deflection - Limits of span-to-effective depth ratio -Calculation of Crack Width - Limits of crack width.

Module -3

Design of Sections for Flexure: Analysis of members at ultimate strength - Preliminary Design - Final Design for Type I members.

Module -4

Design for Shear: Analysis for shear - Components of shear resistance - Modes of Failure - Limit State of collapse for shear - Design of transverse reinforcement.

Module -5

Different anchorage system and design of end block by latest IS codes.

Course outcomes: After studying this course, students will be able to:

1. Understand the requirement of PSC members for present scenario.
2. Analyse the stresses encountered in PSC element during transfer and at working.
3. Understand the effectiveness of the design of PSC after studying losses
4. Capable of analyzing the PSC element and finding its efficiency.
5. Design PSC beam for different requirements.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub- questions) from each module.
- Each full question will have sub- question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

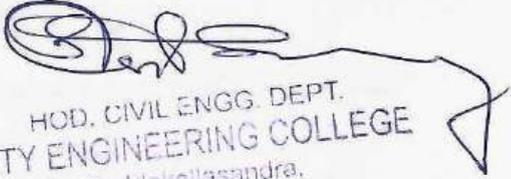
Textbooks:

1. Krishna Raju, N. "Pre stressed Concrete", Tata McGraw Hill Publishing Company, New Delhi 2006
2. Krishna Raju, N., "Pre-stressed Concrete - Problems and Solutions", CBS Publishers and Distributors, Pvt. Ltd., New Delhi.
3. Rajagopalan N, "Pre - stressed Concrete", Narosa Publishing House, New Delhi

Reference Books:

1. Praveen Nagarajan, "Advanced Concrete Design", Person Publishers
2. P. Dayaratnam, "Pre stressed Concrete Structures", Scientific International Pvt. Ltd.
3. Lin T Y and Burns N H, 'Design of Pre - stressed Concrete Structures', John Wiley and Sons, New York
4. Pundit G S and Gupta S P, "Pre - stressed Concrete", C B S Publishers, New Delhi
5. IS: 1343: Indian Standard code of practice for Pre stressed concrete, BIS, New Delhi.
6. IS: 3370-Indian Standard code of practice for concrete structures for storage of liquids, BIS, New Delhi.

Mjra


HOD. CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062.



DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2022 - 23

Course Title: DESIGN OF PRE STRESSED CONCRETE ELEMENTS	Course Code : 18CV81
Internal Marks : 40	End Term Marks : 60
Semester : VIII	Academic year : 2022 - 23
Lesson plan Author: MANJUNATH.K.E / GURUPRASAD	Date : 1/04/2023

Program Objectives:

- Engineering knowledge
- Problem analysis
- Interpretation of data

Course objectives:

This course will enable students to learn Design of Pre-Stressed Concrete Elements

Course outcomes:

After studying this course, students will be able to:

1. Understand the requirement of PSC members for present scenario.
2. Analyze the stresses encountered in PSC element during transfer and at working.
3. Understand the effectiveness of the design of PSC after studying losses
4. Capable of analyzing the PSC element and finding its efficiency.
5. Design PSC beam for different requirements.

MODULE 1

Week	Days/Date	Contents of Unit	Revised Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Introduction and analysis of members	L1, L2	CO1
	2	Types of prestressing, advantages limitations,	L1, L2	CO1
	3	prestressing system, anchorage devices	L1, L2	CO1
	4	Material introduction	L1, L2	
2	1	mechanical properties of high strength concrete,	L1, L2	CO1
	2	high strength steel	L1, L2	CO1
	3	Stress strain curve for high strength concrete,	L1, L2	CO1
	4	analysis of stress concept	L1, L2	
3	1	analysis of stress concept	L1, L2	CO1
	2	Comparison of behavior of reinforced concrete, pre-stressed concrete, force concept	L1, L2	CO1
	3	Force concept, load balance concept	L1, L2	CO1
	4	Kern point, pressure line	L1, L2	CO1

MODULE 2

Week	Days/Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
4	1	Losses in prestress, loss of pre-stress due to elastic shortening.	L1, L2	CO2
	2	Friction, anchorage slip, creep of concrete	L1, L2	CO2

MODULE 5

Week	Days/ Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
14	1	Composite sections	L1, L2, L3	CO5
	2	Composite sections	L1, L2, L3	CO5
	3	Types of composite sections	L1, L2, L3	CO5
	4	Types of composite sections	L1, L2, L3	CO5
15	1	Types of composite sections	L1, L2, L3	CO5
	2	Limit state of collapse of shear	L1, L2, L3	CO5
	3	Limit state of collapse of shear	L1, L2, L3	CO5
	4	Limit state of collapse of shear	L1, L2, L3	CO5
16	1	Flexure and strength of composite sections	L1, L2, L3	CO5
	2	Flexure and strength of composite sections	L1, L2, L3	CO5
	3	Flexure and strength of composite sections	L1, L2, L3	CO5
	4	Flexure and strength of composite sections	L1, L2, L3	CO5

Bloom's Taxonomy Level

L1-Remembering L2-Understanding L3-Appling L4-Analysing L5-Evaluating L6-Creating

TEXT BOOKS:

1. **Pre-stressed Concrete-** N. Krishna Raju - Tata Mc. Graw Publishers.

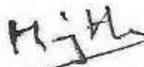
2. **Pre-stressed Concrete-** P. Dayarathnam : Oxford and IBH Publishing Co.

3. **Design of pre-stressed concrete structures-** T.Y. Lin and Ned H. Burns - John Wiley & Sons, New York.

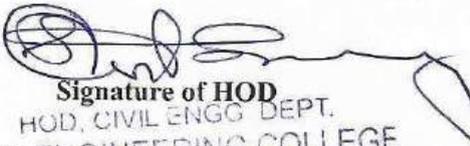
4. **Fundamental of pre-stressed concrete-** N.C. Sinha & S.K. Roy

5. IS : 1343 : 1980

6. **Pre-stressed Concrete-** N. Rajgopalan



Signature of Faculty



Signature of HOD
HOD, CIVIL ENGG DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062.

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

18CV81

Eighth Semester B.E. Degree Examination, July/August 2022
Design of Prestressed Concrete

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Distinguish between pre tensioning and post tensioning. (06 Marks)
 b. List the advantages of PSC over RCC. (04 Marks)
 c. Explain with sketch Hoyer's long line systems of pre-tensioning. (10 Marks)

OR

- 2 a. Explain concept of Thrust line. (06 Marks)
 b. A rectangular concrete beam of cross section 300mm deep and 200mm wide is prestressed by means of 15 wires of 5mm diameter located 65mm from the bottom of beam and 3 wires of 5mm diameter, 25mm from top. Assuming the prestress in steel as 840N/mm^2 , calculate the stresses at the extreme fibres of mid span section. When the beam is supporting its own weight over a span of 6m. If a uniformly distributed live load of 6kN/m is imposed, evaluate the maximum working stress in concrete. (14 Marks)

Module-2

- 3 a. List different types of losses in post tensioning system. Explain any two. (06 Marks)
 b. A pretensioned beam, 200mm wide and 300mm deep is prestressed by 10 wires, of 7mm diameter initially stressed to 1200N/mm^2 , with their centroids located 10mm from the soffit. Find the maximum stress in concrete immediately after transfer, allowing only for elastic shortening of concrete. If the concrete undergoes a further shortening due to creep and shrinkage while there is a relaxation of 5% of steel stress, estimate the final percentage loss of stress in the wires using the Indian Standard Code regulations and following data:
 $E_s = 210\text{kN/mm}^2$, $E_c = 5000\sqrt{f_{cu}}$, $f_{cu} = 42\text{N/mm}^2$ creep co-efficient (ϕ) = 1.6,
 total residual shrinkage strain = 3×10^{-4} . (14 Marks)

OR

- 4 a. Explain:
 i) Short term deflection
 ii) Long term deflection
 iii) Limiting deflection as per IS code. (06 Marks)
 b. A type-3 post tensioned pre stressed concrete beam of 10m span. The beam is post tensioned using three high tensile bars of 40mm diameter located @ an effective depth of 700mm. The effective cover from each of the vertical face of the beam is 60mm. the effective pre stressing force in each bar after all losses is 600kN. Given, cross section $450\text{mm} \times 750\text{mm}$, $\frac{x}{d} = 0.43$, $\frac{f_t}{b_s} = 0.081$, $f_p = 1035\text{N/mm}^2$, $E_s = 200\text{kN/mm}^2$, $E_c = 28\text{kN/mm}^2$, compute the width of cracks in the tension zone if the service load moment at mid span is 1040kN-m. (14 Marks)

1 of 2

Important Note: 1. On completing your answers, compound scribble diagonal cross lines on the remaining blank pages.
 2. Any recoding of tubarification, appeal to evaluator and/or equations written eg. 12.8.50 will be treated as malpractice.

18CV81

Module-3

- 5 a. Explain failure modes of beam under flexure. (06 Marks)
 b. A post tensioned bridge girder with unbonded tendons is of box section of overall dimensions 1200mm wide by 1800mm deep, with wall thickness of 150mm. The high tensile steel has an area of 4000mm² and is located at an effective depth of 1600mm. The effective prestress in steel after all losses is 1000N/mm² and the effective span of girder is 24m. If $f_{ck} = 40\text{N/mm}^2$ and $f_p = 1600\text{N/mm}^2$, estimate the ultimate flexural strength of section. (14 Marks)

OR

- 6 Design a simply supported Type-I pre stressed beam with total moment $M_T = 455\text{kN-m}$ including self weight moment of $M_{sw} = 55\text{kN-m}$. The height of the beam is restricted to 920mm. The pre stress at transfer $f_{po} = 1035\text{N/mm}^2$ and pre stress at service $f_{pe} = 860\text{N/mm}^2$. The allowable compressive stresses are 12.5N/mm^2 at transfer and 11.0N/mm^2 at service. The pre-stressing tendon is 7 wire strand with nominal diameter of 12.8mm and nominal area of 99.3N/mm². (20 Marks)

Module-4

- 7 a. Explain different methods of improving shear resistance of PSC members. (05 Marks)
 b. Explain the mechanism of shear failure in PSC beams. (05 Marks)
 c. The support section of a PSC beam 150×300 is to resist a shear of 100kN. The pre stress at centroidal axis is 5N/mm^2 , and $f_{ck} = 40\text{N/mm}^2$. The cover to tension reinforcement is 45mm. Check the section for shear and design suitable shear reinforcement using IS Code recommendation. (10 Marks)

OR

- 8 a. Differentiate between web shear and flexure shear cracks in PSC members with neat sketches. (06 Marks)
 b. A pre stressed I section has the following properties. Area = $55 \times 10^3\text{mm}^2$, $I = 189 \times 10^7\text{mm}^4$, statical moment about the centroid = $468 \times 10^4\text{mm}^3$, thickness of web = 50mm. It is prestressed horizontally by 24 wires of 5mm diameter and vertically by similar wires at 150mm centres. All the wires carry a tensile stress of 900N/mm^2 . Calculate the principal stress at the centroid when shearing force of 80kN acts upon this section. (14 Marks)

Module-5

- 9 a. Write a note on anchorage zone stresses. (04 Marks)
 b. Explain end zone reinforcement. (06 Marks)
 c. The end block of a post-tensioned prestressed concrete beam, 300mm wide and 300mm deep, is subjected to a concentric anchorage force of 832.8kN by a Freyssinet anchorage of area 11720mm^2 . Design and detail the anchorage reinforcement for the end block. (10 Marks)

OR

- 10 a. Explain with neat sketches the following pre-stressing systems:
 i) Freyssinet's system ii) BBRV system. (10 Marks)
 b. The end block of a post-tensioned bridge girder is 600mm wide by 1200mm deep. Two cables, each comprising 97 high tensile wires of 7mm diameter, are anchored using square anchor plates of side length 410mm with their centres located at 600mm from the top and bottom edges of beam. The jacking force in each cable is 4500kN. Design a suitable anchorage zone reinforcement using Fe-415 grade HYSD bars conforming to IS:1343 code provisions. (10 Marks)

2 of 2

CBCS SCHEME



USN

--	--	--	--	--	--	--	--	--	--

15CV82

Eighth Semester B.E. Degree Examination, Jan./Feb. 2021 Design of Pre-Stressed Concrete Elements.

Time: 3 hrs.

Max. Marks: 80

- Note: 1. Answer FIVE full questions, choosing ONE full question from each module.
2. Use of IS 1343 – 2012 is permitted.
3. Missing data, if any, may be suitably assumed.

Module-1

- 1 a. State the advantages and disadvantages of pre-stressed concrete. (04 Marks)
b. Explain with the help of neat sketches Freyssinet and Magnel Blaton method of pre-stressing. (06 Marks)
c. What is pressure line? Draw the pressure line for a simply supported rectangular beam of size $B \times D$ subjected to udl and pre-stressed by force P at a constant eccentricity of $D/6$ such that the bottom fibre stress at mid span due to all loads and P equal to zero. (06 Marks)

OR

- 2 a. Explain with neat sketch Gifford Udall system of pre-stressing. (04 Marks)
b. Explain concept of load balancing in PSC design. (04 Marks)
c. A concrete beam of symmetrical I section spanning 8m, the width and thickness of flanges are 220mm and 60mm respectively, the overall depth of the beam is 410mm, thickness of web is 80mm, the beam is pre-stressed by a straight cable with an eccentricity of 150mm with effective force of 150kN, the live and load on the beam is 2.5kN/m, draw the stress distribution diagram at central section for the loaded beam. (08 Marks)

Module-2

- 3 a. How do you estimate the loss of pre-stress due to :
i) Elastic deformation of concrete
ii) Shrinkage of concrete
iii) Friction between cable and duct. (06 Marks)
b. A PSC beam of 200mm \times 300mm is pre-stressed with steel wires of area 320mm² located at constant eccentricity of 50mm and carrying an initial stress of 1100N/mm², span of the beam is 9m. Calculate percentage of loss of stress in wires if beam is post tensioned. If $E_s = 210\text{GPa}$, $E_c = 35\text{GPa}$, relaxation of stress in steel = 4.8%, shrinkage of concrete is 200×10^{-6} per post tensioning, creep coefficient = 1.6, slip at anchorage is 1mm and friction coefficient for wave effect is 0.0012/m. (10 Marks)

OR

- 4 a. List the factors influencing deflections of pre-stressed concrete members. (06 Marks)
b. A concrete beam having a rectangular section of 150mm \times 300mm is pre-stressed by a parabolic cable having an eccentricity of 75mm at centre of span towards the soffit and an eccentricity of 25mm towards top at support section. The effective force in the cable is 350kN. The beam supports a concentrated load of 20 KW at centre of span in addition to a self weight. If $E_c = 38\text{GPa}$ and span is 8m calculate : i) short term deflection at centre of span under pre-stress. Self weight and live load ii) long term deflection if loss ratios 0.8 and creep coefficient as 1.6. (10 Marks)

Module-3

- 5 a. Explain the different types of flexural failures observed in pre-stressed concrete beam. (06 Marks)
- b. A post tensioned beam with unbounded tendon is of triangular section 400mm wide with an effective depth of 800mm. The cross sectional area of pre-stressing steel is 2840mm^2 . The effective pre-stress in steel after all losses is 900N/mm^2 . The effective span of the beam is 16m. Determine the ultimate moment capacity of the section if $f_{ck} = 40\text{N/mm}^2$ using IS code 1343 recommendation. (10 Marks)

OR

- 6 A pre stressed beam of rectangular section of 250mm wide is to be designed for an imposed load of 12kN/m on a span of 12m. The stress in the concrete must not exceed 17N/mm^2 in compression or 1.4N/mm^2 in tension at any time and the loss of pre-stress to be 15 percent. Calculate : i) minimum possible depth of the beam ii) minimum pre-stressed force and eccentricity. (16 Marks)

Module-4

- 7 a. Explain the mechanism of shear failure in PSC beams. (06 Marks)
- b. A PSC beam of size $400\text{mm} \times 1000\text{mm}$ is subjected to a shear force of 600kN under working loads at support. The effective pre-stressing force in tendon is 800kN . The cable is parabolic with zero eccentricity at support and 300mm below centroidal axis at midspan. The span of the beam 12m. Estimate principle tension in concrete at support section and design the shear reinforcement. Use M40 concrete. (10 Marks)

OR

- 8 a. Explain different methods of improving shear resistance of PSC members. (04 Marks)
- b. Differentiate between web shear, flexural and flexural shear cracks in PSC members. (06 Marks)
- c. The support section of PSC beam $150\text{mm} \times 300\text{mm}$ is required to carry an ultimate shear force of 120kN . The compressive stress at centroidal axis is 5N/mm^2 and $f_{ck} = 40\text{N/mm}^2$, $f_y = 415\text{N/mm}^2$, cover to reinforcement 60mm . Design the suitable shear reinforcement at the section. (06 Marks)

Module-5

- 9 a. Write a note on Guyon's method of computing the bursting stress in end block. (06 Marks)
- b. The end block of a post tensioned beam is $80\text{mm} \times 160\text{mm}$. A pre-stress wire 7mm in diameter stressed to 1200N/mm^2 has to be anchored against the end block at the centre. The anchorage plate of size $50\text{mm} \times 50\text{mm}$, the wire bears on the plate through a female cone of 20mm diameter. Determine thickness of plate if permissible shear in concrete at transfer as 20N/mm^2 and permissible shear in steel as 94.5N/mm^2 . (10 Marks)

OR

- 10 A post tensioned PSC beam $550\text{mm} \times 550\text{mm}$, four cables each made of 7 wires and 12mm diameter strands and carrying force of 1000kN are anchored by plate anchorages 150mm by 150mm located with their centre, at 125mm from the edges of the end block. The cable duct is of 50mm diameter, $f_{ck} = 45\text{N/mm}^2$ and strength of concrete at transfer is 25N/mm^2 . Permissible stress for anchorage reinforcement is 260N/mm^2 . Design suitable anchorage for the end block. (16 Marks)

Module-3

- 5 a. What are the different flexural failure modes observed in prestressed concrete beam? Explain with sketches. (06 Marks)
- b. A post tensioned bridge girder with unbounded tendons is of box section of overall dimensions 1200mm wide \times 1800mm deep with wall thickness 150mm. The high tensile steel has an area of 4000mm² and is located at an effective depth of 1600mm. The effective prestress in steel after all losses is 1000N/mm² and the effective span of the girder is 24m. If $f_{ck} = 40\text{N/mm}^2$ and $f_p = 1600\text{N/mm}^2$, estimate the ultimate flexural strength of the section. (10 Marks)
- 6 Design a post tensioned prestressed concrete roof girder to suit the following data:
 Effective span = 20m
 Live load = 12kN/m
 $f_{ck} = 50\text{N/mm}^2$
 $f_{ct} = 41\text{N/mm}^2$
 loss ratio = 0.85
 Cable containing 12 wires of 7mm diameter ($f_p = 1500\text{N/mm}^2$) are available for use. Design the girder as Type-1 member to conform IS1343. (16 Marks)

Module-4

- 7 a. Explain different methods of improving shear resistance of PSC members. (06 Marks)
- b. A prestressed girder of rectangular section 150mm wide shear force of 130kN. The uniform prestress across the section is 5N/mm². Given the characteristic strength (cube) strength of concrete is 40N/mm² and Fe-415 HYSD bars of 8mm diameter, design suitable spacing for the stirrups conforming to Indian standard code IS-1343 recommendations. Assume cover to the reinforcement as 50mm. (10 Marks)
- 8 a. Explain mechanism of shear failure in PSC beams. (06 Marks)
- b. The horizontal prestress at the centroid of a concrete beam of rectangular section 120mm \times 250mm is 7N/mm² and the maximum shearing force on the beam is 70kN. Calculate the maximum principal tensile stress, what is the maximum vertical stress required to eliminate this principal stress? (10 Marks)

Module-5

- 9 a. Write a note on zone stresses. (06 Marks)
- b. The end block of a prestressed concrete girder is 200mm wide \times 300mm deep. The beam is post tensioned by two Freyssinet anchorage each of 100mm diameter with their centres located at 75mm from top and bottom of beam. The force transmitted by each anchorage being 2000kN. Compute the bursting force and design suitable reinforcements according to IS1343, sketch the arrangement of anchorage zone reinforcement. (10 Marks)
- 10 The mid section of a composite T-beam comprises a pretensioned beam 300mm wide and 900mm deep and an in-situ cast slab 900mm wide and 150mm deep. The effective prestressing located 200mm from the soffit of the beam is 2180kN. The moment due to the weight of the precast section is 273kN-m at mid span. After this is erected in place, the top slab is cast producing a moment of 136.5kN-m at midspan. After the slab concrete is hardened, the composite section is to carry a maximum live load moment of 750kN-m. Compute the resultant final stresses at
 i) The top of slab
 ii) The top and bottom of precast section. (16 Marks)

--	--	--	--	--	--	--	--	--	--

Eighth Semester B.E. Degree Examination, June/July 2019 Design of Pre-Stressed Concrete Elements

Time: 3 hrs.

Max. Marks: 80

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of IS 1343 is permitted.

Module-1

- 1 a. Define pre-stressed concrete. Write any three differences between pre-tensioning and post-tensioning. (05 Marks)
- b. Explain with neat sketch Gifford Udal system of pre-stressing. (05 Marks)
- c. What is pressure line? plot the pressure line for a simply supported rectangular beam of size $b \times h$ subjected to uniformly distributed load and pre-stressed by a force P at a constant eccentricity of $h/6$ such that bottom fibre stress at midspan due to all loads and P equal to zero. (06 Marks)

OR

- 2 a. Explain the concept of load balancing in pre-stressed concrete design. (06 Marks)
- b. A concrete beam of symmetrical I section of simply supported span 10m has width and thickness of flange 250mm and 80mm respectively. thickness of web is 80mm and overall depth of section is 500mm. The beam is pre-stressed by a parabolic cable with an eccentricity of 150mm below centroidal axis at midspan and concentric at supports. The initial and final pre-stressing force in the cable is 250 kN and 200 kN respectively. The beam supports a live load of 3 kN/m. Calculate the fibre stress in concrete at transfer and at working loads sketch the stress distribution. (10 Marks)

Module-2

- 3 a. List the various types of losses in pre-stressed concrete members. Explain the types of loss of pre-stress in post tensioned members only. (06 Marks)
- b. A PSC beam $200\text{mm} \times 300\text{mm}$ is pre-stressed with wires of area 300mm^2 located at an eccentricity of 100mm below centroidal axis at midspan and zero at supports. Initial pre-stress in the wires is 1 kN/mm^2 . The span of the beam is 10m. Calculate the loss of pre-stress and total percentage of loss of pre-stress in wires if i) the beam is pre-tensioned ii) the beam is post tensioned, using the following data :
- Grade of concrete M_{40} , $E_s = 210 \text{ kN/mm}^2$ shrinkage strain in concrete for pre tensioned member = 300×10^{-6} Age of concrete at transfer for post tensioned beam = 8 days, creep coefficient = 1.6 Slip at anchorage = 2mm coefficient of friction between concrete and cable duct = 0.55 Friction coefficient for wave effect = 0.0015/m. (10 Marks)

OR

- 4 a. What are the factors affecting deflection of a PSC beam? (04 Marks)
- b. A PSC beam span supported over a span of 8m is of rectangular section of size 150mm × 300mm. The beam is pre-stressed by a parabolic cable having an eccentricity of 80mm below centriodal axis at mid span and 30mm above the centriodal axis at the ends. The initial pre-stressing force in the cable is 350 kN. The beam supports a concentrated load of 10kN at midspan and uniformly distributed load of 2 kN/m over the entire span. Grade of concrete is M_{40} . Estimate the following deflection :
- Short term deflection due to pre-stress and self weight.
 - Long-term deflection due to pre-stress, self weight and imposed loads, allowing 20% loss of pre-stress and taking creep coefficient of 1.80
 - Check the deflection as per IS 1342-1980 requirements. (12 Marks)

Module-3

- 5 a. A post tensioned unbounded beam section 120mm × 300mm is pre-stressed by 7 wires of 5mm diameter with an effective cover of 50mm and effective stress of 1200 N/mm². The beam is of 7.5m span. If M_{40} concrete is used and $f_p = 1600$ MPa, find the ultimate flexural strength of the section. (08 Marks)
- b. A post tensioned bounded Tee section has a flange width of 800mm and thickness of 250mm. The thickness of web is 200mm. The area of high tensile wire is 4000 mm² located at 1200mm from top of flange. The characteristic strength of steel and concrete are 1500 N/mm² and 40 N/mm² respectively. Calculate the ultimate moment capacity of the section using IS 1343 recommendation. (08 Marks)

OR

- 6 Design a pre-stressed concrete beam as Type-1 member to carry a superimposed load of 12 kN/m over a simply supported span of 25m. The permissible stress in compression for concrete at transfer and working loads are 14 N/mm² and 12 N/mm² respectively. Initial stress in pre-stressing cable is 1000 N/mm². Loss of pre-stress is 20%. Adopt Freyssenet cables each of 12 wires of 5 mm diameter. (16 Marks)

Module-4

- 7 a. Explain different methods of improving shear resistance of PSC members. (05 Marks)
- b. Explain the mechanism of shear failure in PSC beams. (05 Marks)
- c. The support section of PSC beam 120mm × 250mm is required to carry an ultimate shear force of 70kN. The compressive stress at the centriodal axis is 5MPa and $f_{ck} = 40$ MPa, $f_y = 415$ MPa cover to reinforcement = 50mm. Design the suitable shear reinforcement at the section as per IS - 1343 recommendation. (06 Marks)

Design of Pre-Stressed Concrete Elements

Assignment question

1st module

1. Define pre stressed concrete. Write any three differences between pre-tensioning and post-tensioning.
2. Explain the concept of load balancing in pre-stressed concrete design
3. A prestressed concrete beam supports a live load of 4 kN/m over a simply supported span of 8m. The beam has a I section with overall depth of 400mm. The thickness of the flange and web are 60 and 80mm respectively. The width of the flange is 200mm the beam is to be prestressed by an effective prestressing force of 235 kN at a suitable eccentricity such that the resultant stress at the soffit of the beam @ centre of the span is zero.
 - a) Find the eccentricity required for the force.
 - b) If the tendon is concentric, what should be the magnitude of the pre-stressing force for the resultant stress to be zero @ the bottom of the fibre of the central span S/n.
4. A rectangular PSC beam 400 X 300mm has a span of 9m. The beam supports two-point loads 30kN each at the middle third portion is 140mm, suggest a suitable cable profile and calculate the effective prestressing force required to balance the bending effect of the loads. If the resultant tensile stress @ the midspan is to be made zero due to prestress, self-weight, and imposed load, calculate the initial prestressing force in the cable for the above profile.
5. A rectangular concrete beam 100mm wide 250mm deep, spanning over 8m is prestressed by a parabolic cable with prestressing force 250kn with zero eccentricity @ support and 40mm @ midspan. The beam supports a live load of 1.2kN/m. Determine the position of pressure line (thrust line).
6. A concrete beam with a single overhang is simply supported @A&B over a span of 8m and overhang bc is 2m. The beam is 300*900mm and supports 3.52kN/m UDL. Determine the profile of the cable to balance dl and LL.

2nd module

1. List the various types of losses in pre-stressed concrete members
2. What are the factors affecting deflection of PSCbeams?
3. A pre-tensioned concrete beam 200 X 300mm and span 6m is initially pre-stressed by a force of 400 kN applied @ a constant eccentricity 70mm by tendons of area 400mm². If E_s is $2 \times 10^5 \text{ N/mm}^2$ creep co-efficient in concrete is 2. Shrinkage is 0.0002, stress relaxation in steel is 3%. Find the % loss of stress in tendons.

4. A post tensioned pre-stressed concrete of 50m span is subjected to transfer prestressing force of 9.38mn, transfer of force is @ 28 days strength. Profile of the cable is parabolic with maximum eccentricity @ midspan section as 1100mm. Determine the loss of prestress and find the jacking force required. The beam is subjected to a live load of 24 kN/m and jacking is done @ both the ends of the beams.
5. Given $A_s = 8930\text{mm}^2$, $A_c = 947100\text{mm}^2$, $I = 6224 \times 10^8\text{mm}^4$, anchorage slip = 2.5mm/anchorage, loss due to relaxation = 2% of initial stress, creep coefficient = 1.2, $\mu = 0.25$, $k = 0.0015/\text{m}$ $E_s = 38.2\text{gpa}$, $E_c = 210\text{gpa}$, density of concrete = 24kN/m^3
6. A concrete beam having a rectangular section 150x300 mm is prestressed by a parabolic cable at an eccentricity of 75mm at a midspan towards bottom soffit and at an eccentricity of 25mm towards top at support sections. The effective prestressing force of 350kN. The beam supports a concentrated load of 20kN at the centre of the span in addition to the self-weight with a span of 8m. find the short-term deflection at the centre of the span under prestress, self-weight and live load. Find also the long-term deflection if the loss ratio is 0.8 and the creep co-efficient is 1.6. $E_c = 38\text{kN/mm}^2$.
7. A prestressed concrete beam of rectangular section 150x400mm deep is stressed by 4 cables, each carrying an effective force of 250kN. The span of the beam is 12m. the first cable is parabolic with eccentricity of 50mm below the centroidal axis at the midspan and 50mm above the centroidal axis at supports and second cable is also a parabolic with zero eccentricity at supports and an eccentricity of 50mm at midspan. The third and fourth cables are straight with a constant eccentricity of 50mm below the centroidal axis. If the beam supports a UDL of 10kN/m and $E_c = 40\text{kN/mm}^2$. Estimate the instantaneous deflections at the following stages
 - a. Prestress + self-weight of the beam.
 - b. Prestress + self-weight + live load

If the loss ratio is 0.8 and creep co-efficient is 1.6, estimate the long-term deflection

DESIGN OF PRE-STRESSED CONCRETE

Assignment questions

1. A pre tensioned concrete beam (200X300mm) and span 6m is initially pre stressed by a force of 400kN applied at a constant eccentricity of 70mm by tendons of area 400mm². If $E_s=2 \times 10^5$ N/mm², $E_c=0.333 \times 10^5$ N/mm², creep coefficient in concrete = 2.0, shrinkage strain in concrete = 0.0002 stress relaxation in steel = 3% and percentage loss of stress in tendon.
2. What are the different modes of failure in flexure and list the factors which influence the flexural failures in PSC beam.
3. Explain:
 - a. Short term deflection
 - b. Long term deflection
 - c. Limiting deflection as per IS code.
4. A pretensioned, T-section has a flange 1200 mm wide and 150 mm thick. The width and depth of the rib are 300 and 1500 mm respectively. The high-tensile steel has an area of 4700mm² is located at an effective depth of 1600 mm. If the characteristic cube strength of the concrete and the tensile strength of steel are 40 and 1600N /mm² respectively, calculate the flexural strength of the T-section.
5. A rectangular concrete beam of cross section 150mm wide and 300 mm deep is Simply supported over a span of 6m. It is prestressed by means of symmetric parabolic Cable, at a distance of 120mm from bottom fibers at support section and at a distance of 60mm from bottom fibers at mid span section. Initial prestress in the cable in the cable is 300kN. Determine 1)Maximum deflection of the beam at transfer. 2) central concentrated force to be applied to nullify the above deflections. Take unit of concrete as 25 kN/m³. Modulus of elasticity of concrete as 3.8×10^4 N/mm²
6. A prestressed concrete beam of rectangular section, 150 mm wide and 400mm deep is stressed by 4 cables, each carrying an effective force of 250 kN. The span of the beam is 12m. The first cable is parabolic with an eccentricity of 50mm below the centroidal axis at mid span and 50mm above the centroidal axis at supports. The second cable is also parabolic with zero eccentricity at supports and an eccentricity of 50mm at the mid span. The third and fourth cables are straight with constant eccentricity of 50mm below the centroid axis. If the beam supports a udl of 10 kN/m, and $E_c = 40$ kN/mm². Estimate the instantaneous. Deflection at the following stages
 - a) Prestress + self weight of beam + and
 - b) Prestress + self weight+Live load

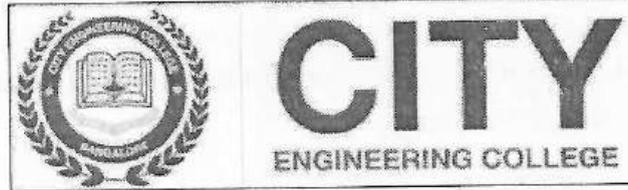
If the loss ratio is 0.8 and the creep coefficient is 1.6, estimate the long term deflection.

7. A prestressed concrete beam rectangular in cross section 200X500mm deep is pre stressed by tendons having an area of 600 mm² located at 100mm from soffit of the beam .Given $f_{ck} = 40 \text{ N/mm}^2$ and $f_p = 1600 \text{ N/mm}^2$. Estimate the ultimate flexural strength of the beam for following cases as per IS code recommendations
 - 1) If the beam is pre tensioned
 - 2) If the beam is post tensioned with effective bond
8. A symmetrical double T section has flange width of 1200 mm and 140 mm thick. The overall depth of beam is 1700mm and thickness of each rib is 150mm. The member is pre stress force of 7500KN. Through the cables located at a distance of 150mm from the soffit. The characteristic strength of concrete is 40 N/mm^2 . Assuming that grouting is 100% effective , determine the ultimate moment of resistance of the section . Adopt IS 1343 provisions
9. post tensioned concrete beam 100mm wide and 300mm deep spanning over 10 meters is stressed by successive tensioning and anchor raging of cables 1,2,&3 The cross-sectional area of each cable is 200 mm^2 and initial stress in the cable is 1200 N/mm^2 and $m = 6$. The first cable is parabolic with the eccentricity 50M below centroidal axis at the centre off span and 50 mm above this centroidal axis at support section the second cable is parabolic with zero eccentricity At the support and eccentricity of 50M at the center of this span the third cable is straight with uniform eccentricity of 50mm Below centroidal axis estimate the percentage loss of stress in each of the cables if they are successively tensioned and anchored.
10. A pre tensioned PSC beam of I section with 160X70 mm flange with thickness of web 50mm and overall depth of I -section is 320mm. The beam is prestressed with 4 high strength steel wires of 7mm at an effective depth of 265mm, $f_{ck} = 50 \text{ N/mm}^2$, $f_p = 1600 \text{ N/mm}^2$. Find the ultimate flexural strength

DESIGN OF PRE-STRESSED CONCRETE

Assignment questions

1. A prestressed, concrete beam supports. Load of 4 kN/m over a simply supported span of 8m. The beam has an I-section with an overall depth of 400mm. The thickness of the flange and web are 60 mm and 80mm respectively. The width of the flange is 200 mm. The beam is to be prestressed by an effective prestressing force of 235 kN at a suitable eccentricity such that the resultant stress at the soffit of the beam @ the "Centre" the span is zero.
 - a) Find the eccentricity required for the force
 - b) If the tendon is concentric, what should be the magnitude of the pre stressing force for the resultant stress to be zero at the bottom fibre of the central span section
2. A rectangular concrete beam of cross-section 30 cm deep and 20 cm wide is prestressed by means of 15 wires of 5 mm diameter located 6.5 cm from the bottom of the beam and 3 wires of diameter of 5 mm, 2.5 cm from the top. Assuming the prestress in the steel as $840 \text{ N} / \text{m}^2$ calculate the stresses at the extreme fibers of the mid-span section when the beam is supporting its own weight over a span of 6 m. If a uniformly distributed live load of 6kN / m is imposed, evaluate the maximum working stress in concrete. The density of concrete is $24 \text{ kN} / \text{m}^3$
3. A prestressed concrete beam of section 120mm wide and 300mm. deep is used over an effective span of 6 m to support uniformly distributed load of 4 kN/m. [exclusive of self weight]. The beam is prestressed by a straight cable carrying a force of 180 kN and located at an eccentricity of 50mm. Determine the location of thrust line in the beam and plot its position at quarter and central span sections.
4. A concrete beam of symmetrical I-section has an effective span of 2m. The width of beam is 400mm, and depth is 500mm and web thickness is 80mm. The beam is prestressed by parabolic cable with an eccentricity of 150mm at the Centre and zero at the supports. The effective prestress force is 180 kN. The live load on the beam is 8kN/m. Draw the stress distribution diagram at "3m span" from the left for
 - a. Prestress + self weight + live load.
 - b. A prestressed concrete beam of inverted T-section has the following dimensions.
 - (I) Rib - 300x900mm
 - (II) Flange - 300x600mm
5. The beam is simply supported over a span of 15m. The beam is post tensioned with 3 Fressinet cable each Contained 12 wires of 7mm dia, placed @ 150mm from the soffit, at midspan. If the initial prestress is $1 \text{ KN} / \text{mm}^2$, Calculate the maximum uniformly distributed load that it Can carry if maximum compressive stress in concrete is limited to 15 Mpa and tensile stress. Is limited to 1 Mpa. Assume 15% loss of prestress.
6. Explain with sketch Hoyer's long line systems of pre-tensioning.
7. Distinguish between pre tensioning and post tensioning and list the advantages of PSC over RCC.
8. Write any five differences between pre-stressed concrete beam and reinforced concrete. Explain the cracking moment in prestressed concrete members.
9. Explain the concept of load balancing in pre stressed concrete design and explain concept of thrust line.
10. Explain with neat sketch, Magnel Blaton system of pre stressing



Doddakallasandra, Bangalore-560061
DEPARTMENT OF CIVIL ENGINEERING
FIRST INTERNAL TEST

8th SEM

SUBJECT: DESIGN OF PRESTRESSED CONCRETE

DATE: 13/03/2020

MAX MARKS: 50

SUB CODE: 18CV81

TIME: 10:30 TO 12:00PM

Note: Answer all Questions selecting any ONE FULL question from each part.

Q No.	Questions	Marks	CO's	BT Level
PART - A				
1	Explain with sketch Hoyer's long line systems of pre-tensioning.	10	CO1	L1,L2, L3
<i>Or</i>				
2	Write any five differences between pre-stressed concrete beam and reinforced concrete. Explain the cracking moment in prestressed concrete members.	10	CO1	L1,L2, L3
PART - B				
3	Explain with neat sketch, Magnel Blaton system of pre stressing	10	CO1	L1,L2, L3
<i>Or</i>				
4	Explain the concept of load balancing in pre stressed concrete design and explain concept of thrust line.	10	CO1	L1,L2, L3
PART - C				
5	A prestressed concrete beam of inverted T-section has the following dimensions. (I) Rib - 300x900mm (II) Flange - 300x600mm The beam is simply supported over a span of 15m. The beam is post tensioned with 3 Fressinet cable each Contained 12 wires of 7mm dia, placed @ 150mm from the soffit, at midspan. If the initial prestress is 1 KN/mm ² , Calculate the maximum uniformly distributed load that it Can carry if maximum compressive stress in concrete is limited to 15 Mpa and tensile stress. Is limited to 1 Mpa. Assume 15% loss of prestress.	10	CO1	L1,L2, L3

Or

6	A prestressed concrete beam of section 120mm wide and 300mm. deep is used over an effective span of 6 m to support uniformly distributed load of 4 KN/m. [exclusive of self-weight]. The beam is prestressed by a straight cable carrying a force of 180 KN and located at an eccentricity of 50mm. Determine the location of thrust line in the beam and plot its position at quarter and central span sections.	10	CO1	L1,L2, L3
---	---	----	-----	--------------

PART -D

7	A concrete beam of symmetrical I-section has an effective span of 2m. The width of beam is 400mm, and depth is 500mm and web thickness is 80mm. The beam is prestressed by parabolic cable with an eccentricity of 150mm at the Centre and zero at the supports. The effective prestress force is 180 KN. The live load on the beam is 8kN/m. Draw the stress distribution diagram at "3m span" from the left for a) Prestress + self-weight + live load.	10	CO1	L1,L2, L3
---	--	----	-----	--------------

Or

8	A rectangular concrete beam of cross-section 30 cm deep and 20 cm wide is prestressed by means of 15 wires of 5 mm diameter located 6.5 cm from the bottom of the beam and 3 wires of diameter of 5 mm, 2.5 cm from the top. Assuming the prestress in the steel as $840\text{N} / \text{m}^2$ calculate the stresses at the extreme fibers of the mid-span section when the beam is supporting its own weight over a span of 6 m. If a uniformly distributed live load of $6\text{kN} / \text{m}$ is imposed, evaluate the maximum working stress in concrete. The density of concrete is $24\text{kN} / \text{m}^3$	10	CO2	L1,L2, L3
---	---	----	-----	--------------

PART -E

9	A prestressed, concrete beam supports. Load of 4 kN/m over a simply supported span of 8m. The beam has an I-section with an overall depth of 400mm. The thickness of the flange and web are 60 mm and 80mm respectively. The width of the flange is 200 mm. The beam is to be prestressed by an effective prestressing force of 235 KN at a suitable eccentricity such that the resultant stress at the soffit of the beam @ the "Centre" the span is zero. a) Find the eccentricity required for the force b) If the tendon is concentric, what should be the magnitude of the pre stressing force for the resultant stress to be zero at the bottom fibre of the central span section	10	CO2	L1,L2, L3
---	---	----	-----	--------------

Or

10	Distinguish between pre tensioning and post tensioning and List the advantages of PSC over RCC	10	CO2	L1,L2, L3
----	--	----	-----	--------------

CITY ENGINEERING COLLEGE
DEPARTMENT OF ... *Civil Engg.* ...

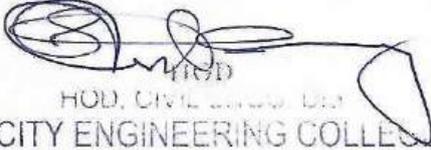
SCHEME FOR VALUATION

Semester & Section: *8th* Internal Test 1st

Date:

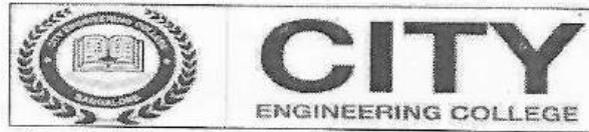
Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	Hoyer's long line systems of prestressing Sketch + Explain (brief)	5+5	10
2.	5 differences b/w pre-stressed concrete beam & reinforced concrete Brief explanation on cracking moment	5+5	10
3.	Magnel Blaton System of prestressing Sketch + Explanation	5+5	10
4.	Concept of load balancing in pre-stress Concept of thrust line.	5 5	10
5.	C/S area of cable = 1385.44 mm^2 $P = 1.385 \times 10^6 \text{ N}$, $A = 450 \times 10^3 \text{ mm}^2$ $\bar{y} = 510 \text{ mm}$, $I_{NA} = 5.85 \times 10^{10} \text{ mm}^4$ $Z_E = 84.72 \times 10^6 \text{ mm}^3$, $Z_B = 114.71 \times 10^6 \text{ mm}^3$ $M_g = 303.75 \text{ kN-m}$, $\therefore M_{qy} = 1169.22 \times 10^6 \text{ N-mm}$ $\therefore W_{qy} = 190 \text{ kN/m}$		10
6.	$DL = 0.864 \text{ kN/m}$ $V_A = V_B = 14.60 \text{ kN}$, $M_{\text{support}} = 0$, $M_{QS} = 16.43 \text{ kN-m}$ $M_{\text{mid span}} = 21.90 \text{ kN-m}$, $\bar{e}_{\text{support}} = 0$ $\bar{e}_{\text{quarter}} = 91.30 \text{ mm}$, $\bar{e}_{\text{mid}} = 121.70 \text{ mm}$		10

High


HOD, CIVIL ENGINEERING
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

Question No.	Detail of the Answer	Marks Distribution	Total Marks
7	$w_g = 2.19 \text{ kN/m}, M_g = 16.43 \text{ kN-m}$ $M_{q1} = 60 \text{ kN-m}, y = e = 140.63 \text{ mm}$ $P_s = \pm 2.03 \text{ N/mm}^2, B.M = \pm 1.32 \text{ N/mm}^2$ Bending stress due to live load = 4.81 N/mm^2 $f_{sup} = 6.07 \text{ N/mm}^2, f_{inf} = -2.13 \text{ N/mm}^2$		10
8.	$A = 46400 \text{ mm}^2, I_{NA} = 847.15 \times 10^6 \text{ mm}^4$ $Z_t = Z_b = 4.23 \times 10^6 \text{ mm}^3, w_g = 1.11 \text{ kN/m}$ $M_g = 8.88 \text{ kN-m}, M_{q1} = 32 \text{ kN-m}$ a) $e = 82.80$ b) $P = 448.4 \times 10^3 \text{ N}$		10
9.	$A = 74 \times 10^3 \text{ mm}^2$ $I_{NA} = 2.22 \times 10^9 \text{ mm}^4, 8.88 \times 10^6 \text{ mm}^3$ $w_g = 1.85 \text{ kN/m}, M_g = 14.8 \text{ kN-m}$ $M_{q1} = 80 \text{ kN-m}$ a) $f_{sup} = \frac{P}{A} - \frac{P \cdot e}{Z} + \frac{M_g}{Z} + \frac{M_{q1}}{Z} = 0$ b) $f_{inf} = \frac{P}{A} + \frac{P \cdot e}{Z} - \frac{M_g}{Z} - \frac{M_{q1}}{Z} = 0$ $P = 421.0 \times 10^3 \text{ N}$ $P \times e = 65.08 \times 10^6$ $e = 154.58 \text{ mm}$		10
10.	5 differences b/w pre tensioning & Post tensioning 7 Advantages of PSG over RCC	5 5	10

MJK



CITY

ENGINEERING COLLEGE

Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING
SECOND INTERNAL TEST

8th SEM

SUBJECT: DESIGN OF PRESTRESSED CONCRETE

DATE: 5/4/2023

MAX MARKS: 50

SUB CODE: 18CV81

TIME: 10:30 TO
12:00PM

Note: Answer all Questions selecting any ONE FULL question from each part.

Q No.	Questions	Marks	CO's	BT Level
-------	-----------	-------	------	----------

PART -A

1	<p>Explain:</p> <p>a. Short term deflection</p> <p>b. Long term deflection</p> <p>c. Limiting deflection as per IS code.</p>	10	CO1	L1,L2, L3
---	--	----	-----	--------------

Or

2	<p>A pretensioned, T-section has a flange 1200 mm wide and 150 mm thick. The width and depth of the rib are 300 and 1500 mm respectively. The high-tensile steel has an area of 4700mm² is located at an effective depth of 1600 mm. If the characteristic cube strength of the concrete and the tensile strength of steel are 40 and 1600N /mm² respectively, calculate the flexural strength of the T-section.</p>	10	CO1	L1,L2, L3
---	--	----	-----	--------------

PART -B

3	<p>What are the different modes of failure in flexure and list the factors which influence the flexural failures in PSC beam.</p>	10	CO1	L1,L2, L3
---	---	----	-----	--------------

Or

4	<p>A rectangular concrete beam of cross section 150mm wide and 300 mm deep is Simply supported over a span of 6m. It is prestressed by means of symmetric parabolic Cable, at a distance of 120mm from bottom fibers at support section and at a distance of 60mm from bottom fibers at mid span section. Initial prestress in the cable is 300kN. Determine 1) Maximum deflection of the beam at transfer. 2) central concentrated force to be applied to nullify the above deflections. Take unit of concrete as 25 kN/m³. Modulus of elasticity of concrete as 3.8X10⁴ N/mm²</p>	10	CO1	L1,L2, L3
---	--	----	-----	--------------

PART - C

5	<p>A prestressed concrete beam of rectangular section, 150 mm wide and 400mm deep is stressed by 4 cables, each carrying an effective force of 250 KN. The span of the beam is 12m. The first cable is parabolic with an eccentricity of 50mm below. The centroidal axis at mid span and 50mm above the centroidal axis at supports. The second cable is also parabolic with zero eccentricity at supports and an eccentricity of 50mm at the mid span. The third and fourth cables are straight with constant</p>	10	CO1	L1,L2, L3
---	--	----	-----	--------------

	<p>eccentricity of 50mm below the centroid axis. If the beam supports a udl of 10 kN/m, and $E_c = 40$ kN/mm². Estimate the instantaneous. Deflection at the following stages</p> <p>a) Prestress + self-weight of beam + and</p> <p>b) Prestress + self weight+Live load</p> <p>If the loss ratio is 0.8 and the creep co efficient is 1.6, estimate the long term deflection.</p>			
--	---	--	--	--

Or

6	<p>A prestressed concrete beam rectangular in cross section 200X500mm deep is pre stressed by tendons having an area of 600 mm² located at 100mm from soffit of the beam .Given $f_{ck} = 40$ N/mm² and $f_p = 1600$ N/mm² . Estimate the ultimate flexural strength of the beam for following cases as per IS code recommendations</p> <p>1) If the beam is pre tensioned</p> <p>2) If the beam is post tensioned with effective bond</p>	10	CO1	L1,L2, L3
---	---	----	-----	--------------

PART-D

7	<p>A pre tensioned concrete beam (200X300mm) and span 6m is initially pre stressed by a force of 400KN applied at a constant eccentricity of 70mm by tendons of area 400mm². If $E_s = 2 \times 10^5$ N/mm², $E_c = 0.333 \times 10^5$ N/mm² ,creep coefficient in concrete = 2.0, shrinkage strain in concrete = 0.0002 stress relaxation in steel = 3% and percentage loss of stress in tendon</p>	10	CO1	L1,L2, L3
---	---	----	-----	--------------

Or

8	<p>A symmetrical double T section has flange width of 1200 mm and 140 mm thick. The overall depth of beam is 1700mm and thickness of each rib is 150mm. The member is pre stress force of 7500KN. Through the cables located at a distance of 150mm from the soffit. The characteristic strength of concrete is 40N/mm². Assuming that grouting is 100% effective, determine the ultimate moment of resistance of the section. Adopt IS 1343 provisions</p>	10	CO2	L1,L2, L3
---	--	----	-----	--------------

PART-E

9	<p>A post tensioned concrete beam 100mm wide and 300mm deep spanning over 10 meters is stressed by successive tensioning and anchor rasing of cables 1,2,&3 The cross-sectional area of each cable is 200mm² and initial stress in the cable is 1200N/mm² and $m = 6$. The first cable is parabolic with the eccentricity 50M below centroidal axis at the centre off span and 50 able about this centroidal axis add support section the second cable is parabolic with zero eccentricity At the support and eccentricity of 50M at the center of this pan the third cable is straight with uniform eccentricity of 50mm Below centroidal axis estimate the percentage loss of stress in each of the cables if they are successively tensioned and anchored.</p>	10	CO2	L1,L2, L3
---	--	----	-----	--------------

Or

10	<p>A pre tensioned PSC beam of I section with 160X70 mm flange with thickness of web 50mm and overall depth of I -section is 320mm. The beam is prestressed with 4 high strength steel wires of 7mm at an effective depth of 265mm, $f_{ck} = 50$ N/mm², $f_p = 1600$ N/mm² Find the ultimate flexural strength</p>	10	CO2	L1,L2, L3
----	---	----	-----	--------------

CITY ENGINEERING COLLEGE
DEPARTMENT OF Civil Engg.

SCHEME FOR VALUATION

Semester & Section: 8th

Internal Test 2nd

Date: 5-4-23

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	Explanation :- Short term deflection Long term deflection Limiting deflection	3 3 4	10
2	Given, diagram $\left(\frac{A_p \cdot f_p}{b \cdot d \cdot f_{ck}}\right) = 0.098$, $\left(\frac{x_u}{d}\right) = 0.213$, $x_u = 308$ mm		10
	$A_{p0} = 3181.25$, $M_R = 9077$ KN-m		
3.	Different modes of failure Factors Influence the flexural failure	5 5	10
4	Given, Sketch $DL = 1.125$ KN/m, $\delta_{DL} = 1.48$ mm $e_1 = \frac{300}{2} = 120 = 30$ mm, $e_2 = (120 - 60) = 60$ mm $\delta_{ps} = -11.05$ mm., Deflection due to central pt load = $w = 27.27 \times 10^{-3}$ N		10
5	$DL = 1.5$, $\delta_{DL} = 12.65$ mm, $\delta_{U} = 84.37$ mm $\delta_1 = -4.681$ mm, $\delta_2 = -5.86$ mm, $\delta_3 = -14.06$ mm $ST = 48$ mm, $\Delta = 201.08$ mm		10

MJK
Staff


HOD, CIVIL ENGRG. DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

Question No.	Details of the Answers	Marks Distribution	Total Marks
6	Pretension, Ratio = 0.3, $f_{pu} = 1392 \text{ N/mm}^2$ $\left(\frac{x_u}{d}\right) = 0.655$, $x_u = 262 \text{ mm}$ $M_u = 242.13 \times 10^6 \text{ N-mm}$ Post tension, Ratio = 0.3, $f_{pu} = 1183.2 \text{ N/mm}^2$ $\left(\frac{x_u}{d}\right) = 0.558$, $x_u = 223.2 \text{ mm}$ $M_u = 217.4 \text{ kN-m}$		10
7.	a) loss due to elastic deformation = 66 N/mm^2 b) loss due to shrinkage = 40 N/mm^2 c) loss due to creep = 132.24 N/mm^2 d) loss due to relaxation = 1000 N/mm^2 Loss = 30 N/mm^2 Total loss = 268.37 N/mm^2 , % loss = 26.8%		10
8.	Ratio = 0.28, $x_{ue} = 821.5 \text{ mm}$ $\left(\frac{f_{pu}}{0.87 f_p}\right) = 0.87$, $\left(\frac{x_u}{d}\right) = 0.53$ $f_{pu} = 1210 \text{ N/mm}^2$ $M_R = 8128.3 \text{ kN-m}$		10
9.	f_c support = 8 N/mm^2 f_c midspan = 10.67 N/mm^2 Cable 1 = 0, Cable 2 = 58.68 N/mm^2 Cable 3 = 58.68 N/mm^2 , Average loss = 56.90 N/mm^2 % loss = ① $\Rightarrow 9.34\%$ ② = 4.89% ③ = 0		10
10.	$A_p = 154 \text{ mm}^2$ Ratio = 0.116, $\left(\frac{x_u}{d}\right) = 0.252$ $x_u = 66.78 \text{ mm}$, $\left(\frac{f_{pu}}{0.87 f_p}\right) = 1.0$ $f_{pu} = 1392 \text{ N/mm}^2$ $M_u = 50.8 \text{ kN-m}$		10

Mjtl



Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING
THIRD INTERNAL TEST

8th SEM

SUBJECT: DESIGN OF PRESTRESSED CONCRETE

DATE: 08/05/2023

MAX MARKS: 50

SUB CODE: 18CV81

TIME:10:00 TO 11:30PM

Note: Answer all Questions selecting any ONE FULL question from each part.

Q No.	Questions	Marks	CO's	BT Level
-------	-----------	-------	------	----------

PART -A

1	A Freyssinet Anchorage 100mm dia carrying 12 wires of 8mm dia is embedded concentrically in the web of an I section of web thickness 225mm. Using IS code method determine the tensile and bursting tensile force in the end block. Design the end block and sketch the reinforcement details.	10	CO4	L1,L2, L3
---	--	----	-----	-----------

Or

2	Design a simply supported slab for a bridge deck using the following data i) span = 10m, thickness= 500mm ii) permissible compressive stress in concrete at Transfer $f_{ct} = 16.5\text{Mpa}$ iii) Class I member (No tensile stress at any storage) iv) Safe stress in steel 950 Mpa v) Live load on slab =10kN/m ² vi) loss of Prestress =18% Design the prestressing force and eccentricity	10	CO4	L1,L2, L3
---	---	----	-----	-----------

PART -B

3	A Concrete beam of rectangular section 200mm wide and 650mm deep is prestressed by a parabolic Cable located at an eccentricity of 120mm at mid span and zero at the supports. If the beam has a span of 12m and carries a uniformly distributed Live load of 5KN/m. Find the effective force necessary in the cable for zero shear stress at the support section. For this conduction calculate the principal stresses. The density of concrete is 24KN/m ³	10	CO4	L1,L2, L3
---	---	----	-----	-----------

Or

4	The support section of PSC beam 150X400mm is to resist a shear of 100kN. The Prestress at centroidal axis is 5N/mm ² , $f_{ck}=40\text{N/mm}^2$. The cover to tension reinforcement is 45mm. Check the section for shear and Design suitable shear reinforcement, $f_t=1.5\text{N/mm}^2$	10	CO4	L1,L2, L3
---	--	----	-----	-----------

PART - C

5	A prestressed concrete beam of span 10m has a rectangular section 120mm wide and 300mm deep is prestressed by a curved cable carrying an effective force of 180kN. The beam supports a total UDL of 5KN/m. Which includes the self-weight of the member. The beam is additionally prestressed by a vertical cables imparting a stress of 2.50 N/mm ² in the direction of the depth of the beam. Estimate the nature of principal stresses developed at the support section. The cable has zero eccentricity at supports and an eccentricity of 100mm below C.G.C at mid span section	10	CO4	L1,L2, L3
---	---	----	-----	--------------

Or

6	The end block of a prestressed beam 300mm wide and 500mm deep in a section is prestressed by two cables Carrying forces of 450kN each .One of the cable is parabolic located 125mm below the centre line at the centre of the span (10m)and anchored at a point 125mm above the Centre line at The ends the second cable is straight located 100 from the bottom of the distribution plates for the cables are 100mm deep and 250mm wide calculate the maximum tensile stress along the axis off the beam using IS code method	10	CO5	L1,L2, L3
---	--	----	-----	--------------

PART -D

7	A PSC beam 250mm wide and 1500mm deep is subjected to a shearing force of 900kN. The fibre stress under working loads is 4N/mm ² . If the effective Prestress is 1000N/mm ² and area of cable 1500N/mm ² , design the shear reinforcement . The cable are inclined at an angle of the arc sin-1(1/6)	10	CO5	L1,L2, L3
---	---	----	-----	--------------

Or

8	A post tensioned PSC beam 300mm wide is to be designed as a rectangular beam to support a UDL of 20 KN/m over a simply supported span of 18m. The stress in concrete must not exceed 16Mpa in compression and 1.2 Mpa in tension at any stage of loading. Assuming average loss of P.S =17%. Design the beam, calculating depth and prestressing and E.	10	CO5	L1,L2, L3
---	---	----	-----	--------------

PART -E

9	The end block of PSC beam Rectangular in section is 150mm wide and 450mm deep. An Effective prestressing force of 400kN is transmitted to concrete by distribution plate of 150mm wide and 120mm deep concentrically located at the ends calculate the reinforcement for the in block for maximum transverse tension. sketch the details of reinforcement. Use Fe415 grade steel.	10	CO5	L1,L2, L3
---	---	----	-----	--------------

Or

10	The end block of post tensioned beam, rectangular in section is 150mm wide and 300mm deep. A cable comprising of three members of 12.7mm dia and stressed to 1200 N/mm ² is anchored against the end block at 100mm from the soffit of the beam. The anchorage plate is 75mmX75mm. The cable bears on the plate through female cone of 30mm in diameter. Calculate the thickness of the anchorage plate and design the anchorage reinforcement. Given $f_{ck} = 30\text{N/mm}^2$ at transfer, permissible shear stress in steel is 100n/mm^2 use Fe 415 grade of steel for reinforcement and sketch the details of reinforcement.	10	CO5	L1,L2, L3
----	---	----	-----	--------------

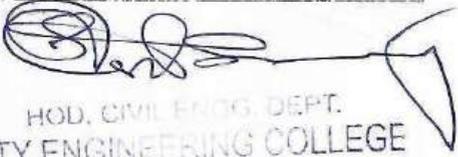
CITY ENGINEERING COLLEGE
CIVIL ENGINEERING DEPARTMENT
SCHEME OF EVALUATION for TEST - III

Subject with code: Design of PSC (18CV81)

SEMESTER: VIIIth

Part	Q No.	Solution	Marks allotted
(1)		$A_c = 603.18 \text{ mm}^2, P = 965.08 \times 10^3 \text{ N}$ →	02
		$f_c = 19.06 \text{ N/mm}^2, a = 88.62 \text{ mm}$ →	02
		$f_{u(\max)} = 12.48 \text{ N/mm}^2$ →	01
		$F_{bt} = 194.79 \times 10^3 \text{ N}$ →	01
		$A_{st} = 895.58 \text{ mm}^2, N_o \text{ of bars} = 12, \text{ Sketch}$ →	04
} 10			
(2)		$D.L = 12 \text{ kN/m}^2, M_g = 150 \text{ kN-m}, M_q = 125 \text{ kN-m}$ →	02
		$Z_{eff} = Z_b = 4167 \times 10^6 \text{ mm}^3, A = 500 \times 10^3 \text{ mm}^2$ →	02
		$f_{sup} = -3.6 \text{ N/mm}^2, f_{inf} = 8.05 \text{ N/mm}^2$ →	02
		$P = 112.5 \times 10^3 \text{ N}$ →	02
		$e = 218.8 \text{ mm}$ →	02
} 10			
(3)		$I = 4.87 \times 10^9 \text{ mm}^4, A_g = 10.56 \times 10^6 \text{ mm}^2$ →	02
		$V_u = 74.25 \times 10^3 - p(0.04)$ →	02
		$P = 1856.25 \times 10^3 \text{ N}$ →	02
		$f_x = 14.27 \text{ N/mm}^2, f_y = 0$ →	02
		$\sigma_{\max} = 14.27 \text{ N/mm}^2, \sigma_{\min} = 0$ →	02
} 10			
(4)		$d_e = 355 \text{ mm}, V_u = 150 \text{ kN}$ →	02
		$V_{co} = 115.46 \times 10^3 \text{ N}, S_r = 323.05 \text{ mm}$ →	04
		$S_v = 604.9 \text{ mm}, \text{ Spacing, diagram}$ →	04
} 10			
(5)		$f_x = 5 \text{ N/mm}^2, I = 220 \times 10^6 \text{ mm}^4, A_g = 1.35 \times 10^6, \sin \theta = 0.04$ →	03
		$V_u = 20000 \text{ N}, \tau_v = 1.26 \text{ N/mm}^2$ →	03
		$\sigma_{\max} = 5.52 \text{ N/mm}^2, \sigma_{\min} = 1.92 \text{ N/mm}^2$ →	04
} 10			

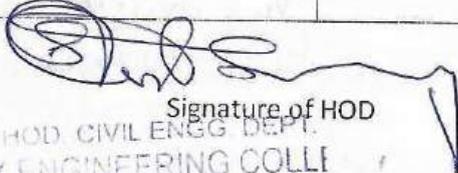
MJK


 HOD, CIVIL ENG. DEPT.
 CITY ENGINEERING COLLEGE
 Doddakallasandra,
 BANGALORE - 560 062.

CITY ENGINEERING COLLEGE
CIVIL ENGINEERING DEPARTMENT

Part	Q No.	Solution	Marks allotted
(6)		$x_{y_0} = 2250 \text{ mm}, x_{z_0} = 300 \text{ mm} \longrightarrow$	01
		$A_p = 75 \times 10^3 \text{ mm}^2, f_c = 6 \text{ N/mm}^2, f_{\text{max}} = 3.9 \text{ N/mm}^2 \longrightarrow$	04
		$x_{y_0} = 200 \text{ mm}, x_{z_0} = 300 \text{ mm} \longrightarrow$	01
		$A_p = 60 \times 10^3 \text{ mm}^2, f_c = 7.5 \text{ N/mm}^2, f_{\text{max}} = 4.25 \text{ N/mm}^2 \longrightarrow$	04
(7)		$V_u = 1350 \text{ kN}, f_t = 21.52 \text{ N/mm}^2, P = 1.5 \times 10^6 \text{ N} \longrightarrow$	03
		$V_{co} = 922.76 \times 10^3 \text{ N}, A_{sv} = 201.06 \text{ mm}^2, S_v = 232.65 \text{ mm} \longrightarrow$	04
		$S_v = 225.92 \text{ mm}, \text{Spacing, diagram} \longrightarrow$	03
(8)		$M_y = 810 \text{ kN-m}, M_z = 296 \times 10^3 \text{ N-mm}, D = 1100 \text{ mm}, b = 300 \text{ mm} \longrightarrow$	02
		$M_y = 320.76 \text{ kN-m} \longrightarrow$	02
		$f_{\text{comp}} = -6.5 \text{ N/mm}^2, f_{\text{tension}} = 21.07 \text{ N/mm}^2 \longrightarrow$	02
		$P = 2404.05 \times 10^3 \text{ N}, e = 34691 \text{ mm} \longrightarrow$	04
(9)		$x_{y_0} = 120 \text{ mm}, x_{z_0} = 150 \text{ mm}, \longrightarrow$	02
		$F_{\text{bst}} = 32 \times 10^3 \text{ N} \longrightarrow$	02
		$A_{\text{dot}} = 142.12 \text{ mm}^2, \text{No of bars} = 6 \text{ No} \longrightarrow$	03
		Sketch \longrightarrow	03
(10)		$A_c = 1385.44 \text{ mm}^2 \longrightarrow$	02
		$P = 1.66 \times 10^6 \text{ N} \longrightarrow$	02
		$F_{\text{bst}} = 282.2 \times 10^3 \text{ N}, A_{\text{st}} = 281.61 \text{ mm}^2, \text{No.} = 10 \longrightarrow$	02
		$P = 1.66 \times 10^6 \text{ N} \longrightarrow$	02
		$t = 176.13 \text{ mm}, \text{Sketch} \longrightarrow$	02

Mithu
Signature of Teacher


 Signature of HOD
 HOD, CIVIL ENGG. DEPT.
 CITY ENGINEERING COLLEGE
 Doddakallasandra,
 BANGALORE - 560 062.

DEPARTMENT OF CIVIL ENGINEERING

CIRCULAR

RefNo: CEC/CV/DAC/ACY 2022-2023/01

Date: 16-09-2022

This is to inform the members of Department Advisory Committee that meeting is scheduled on 16-09-2022 at 10: 00 AM in CV department.

Agenda:

- Planning of Internships & Project work for 7th semester students.
- Involving students in technical activities.
- Planning of AICTE activities for 7th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning to improve result of students.
- Planning of Course preference, Course allocation & Work load distribution for upcoming odd semester.



Dr. Thippeswamy H N

HOD

DEPARTMENT OF CIVIL ENGINEERING

Department Advisory Committee Meeting

Date: 16/09/2022

Time: 10:00 AM

Venue: CV Department

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Dr. H N THIPPESWAMY	HOD	Convenor
2	Mr. MAHESH KUMAR M C	Assistant Professor	Member
3	Mr. GURUPRASAD N	Assistant Professor	Member
4	Mr. VINAYKUMAR S N	Assistant Professor	Co-Convenor
5	Mr. NISHANTH KUMAR	Assistant Professor	Member
6	Mr. JAYANTH K S	Assistant Professor	Member
7	Mr. MANJUNATH K E	Assistant Professor	Member
8	Mr. ANANTHASWAMY M R	Senior Technical Manager, PropEdge Valuation Pvt. Ltd	Alumni (Industry Expert)
9	Mr. Hari prasad S	V J Construction, Senior Engineer	Alumni

The Department Advisory Committee meeting was conducted at Department of CV, on 16th September, 2022, at 10 AM.

Agenda of the Meeting:

- Planning of Internships & Project work for 7th semester students.
- Involving students in technical activities.
- Planning of AICTE activities for 7th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning to improve result of students.
- Planning of Course preference, Course allocation & Work load distribution for upcoming odd semester.

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The HOD welcomed all the staff for the meeting. The following points were discussed as follows.

- Strategy has to be made to improve admissions by visiting nearby diploma colleges to improve lateral entry. The responsibilities are given to Mr. Jayanth K S for identifying polytechnics in the near vicinity.
- It was proposed to conduct a workshop, seminars & guest lecture on recent trending topics.
- The staff members were informed to conduct classes and labs regularly, to timely conduct and complete the entrusted responsibility, to actively participate in the dept and college activities and finally to take suitable actions for getting results and admissions to the dept.
- The guide has to check and discuss about the internship practice taken by students of 7th semester allocated to him or she. The guide must visit the site where internship is practiced by the students and discuss with supervisor of students at the site. The staff members should complete all the five modules and work hard to get 100% pass percentage. The staff members should find out the reasons for poor percentage in the concerned subject and submit report.
- Ant ragging committee should go for inspection at least once in a day. Weekly reports should be submitted by respective faculties to the HOD.

HOD thanked all the staff for having attended the meeting.



Dr. Thippeswamy H N

HOD



CITY
ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

CLASS ROOM: C406

CLASS TEACHER: Prof. Jayanth K S

7th Semester

W. E. F. – 12/09/2022

DAY	9:00 to 10:00	10:00 to 11:00		11:15 to 12: 15	12:15 to 1:15		2:00 to 3:00	3:00 TO 4:00	4:00 to 5:00
	I	II		III	IV		V	VI	VII
MON	18CV72	18CV71	B	18CV745	18CV732	B	18CVL76	18CVL77	
TUE	18CV71	18CV72	R	18ME751	18CV745	R	18CVL76		
WED	18CV732	18ME751	E	18CV71	18CV72	E	18CVL77		
THR	18CV745	18CV732	A	18ME751	Library	A	18CVP78		
FRI	18CVP78		K	18CVP78		K			
SAT									

18CV71	Quantity Surveying and Contract Management
18CV72	Design of RCC and Steel Structures
18CV732	Air Pollution & Control
18CV745	Urban Transport Planning
18ME751	Energy & Environment
18CVL76	Computer Aided Detailing of Structures
18CVL77	Geotechnical Engineering Laboratory
18CVP78	Project Work Phase - 1

Prof. VinayKumar S. N.
 Prof. Manjunath K. E./Prof. Guruprasad
 Prof. VinayKumar S. N./Prof. Mahesh kumar
 Prof. Jayanth K S/Prof. Nishanth kumar
 Prof. Anil
 Prof. Manjunath K. E./Prof. Guruprasad
 Prof. VinayKumar S. N./Prof. Mahesh kumar
 Dr.Thippeswamy H N


HOD
 HOD, CIVIL ENGG. DEPT.
 CITY ENGINEERING COLLEGE
 Doddakallasandra,
 BANGALORE - 560 062


PRINCIPAL
Principal
 City Engineering College,
 Bangalore-560 061

DEPARTMENT OF CIVIL ENGINEERING

COURSE PREFERENCE

ODD SEM

Name of the Faculty: Dr. H N THIPPESWAMY

Designation: Professor & HOD

Sl. No	Course Code and Name	Year/Semester
1	18CVP78 - Project Work Phase - 1	4 th /7 th
2	Internship	4 th /7 th


Signature of Faculty

Name of the Faculty: Mr. MAHESH KUMAR M C

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV732 - Air Pollution and Control	4 th /7 th
2	18ME751 – Energy & Environment	4 th /7 th
3	18CVL77 - Geotechnical Engineering Laboratory	4 th /7 th


Signature of Faculty

Name of the Faculty: Mr. GURUPRASAD N

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV72 - Design of RCC and Steel Structures	4 th /7 th
2	18CV741 - Earthquake Engineering	4 th /7 th
3	18CVL76 - Computer Aided Detailing of Structures	4 th /7 th


Signature of Faculty

Name of the Faculty: Mr. VINAYKUMAR S N

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV71 - Quality Surveying and Contract Management	4 th /7 th
2	18CV732 - Air Pollution and Control	4 th /7 th
3	18CVL77 - Geotechnical Engineering Laboratory	4 th /7 th


Signature of Faculty

Name of the Faculty: Mr. NISHANTH KUMAR

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV733 - Pavement Materials & Construction	4 th /7 th
2	18CV745 - Urban Transport Planning	4 th /7 th


Signature of Faculty

Name of the Faculty: Mr. JAYANTH K S

Designation: Assistant Professor

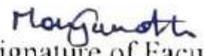
Sl. No	Course Code and Name	Year/Semester
1	18CV733 - Pavement Materials & Construction	4 th /7 th
2	18CV745 - Urban Transport Planning	4 th /7 th
3	18CVL77 - Geotechnical Engineering Laboratory	4 th /7 th


Signature of Faculty

Name of the Faculty: Mr. MANJUNATH K E

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV72 - Design of RCC and Steel Structures	4 th /7 th
2	18CV741 - Earthquake Engineering	4 th /7 th
3	18CVL76 - Computer Aided Detailing of Structures	4 th /7 th


Signature of Faculty

ACADEMIC YEAR: 2022-23 (ODD)

DEPARTMENT OF CIVIL ENGINEERING

COURSE ALLOCATION

ODD SEM

Sl. No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr. H N THIPPESWAMY	18CVP78 - Project Work Phase – 1 Internship	4 th /7 th	
2	Mr. MAHESH KUMAR M C	18CV732 - Air Pollution and Control 18CVL77 - Geotechnical Engineering Laboratory	4 th /7 th 4 th /7 th	
3	Mr. GURUPRASAD N	18CV72 - Design of RCC and Steel Structures 18CVL76 - Computer Aided Detailing of Structures	4 th /7 th 4 th /7 th	
4	Mr. VINAYKUMAR S N	18CV71 - Quality Surveying and Contract Management 18CV732 - Air Pollution and Control 18CVL77 - Geotechnical Engineering Laboratory	4 th /7 th 4 th /7 th 4 th /7 th	
5	Mr. NISHANTH KUMAR	18CV745 - Urban Transport Planning	4 th /7 th	
6	Mr. JAYANTH K S	18CV745 - Urban Transport Planning	4 th /7 th	
7	Mr. MANJUNATH K E	18CV72 - Design of RCC and Steel Structures 18CVL76 - Computer Aided Detailing of Structures	4 th /7 th 4 th /7 th	


HOD

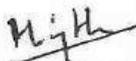
CITY ENGINEERING COLLEGE

Doddakallasandra, Kanakapura Road, Bangalore – 560061

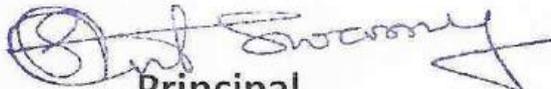


FACULTY ACADEMIC FILE

Name : Manjunath K.E / Gururaj Prasad
Designation : Assistant Professor
VTU Id : ICECV0014497
Academic Year : 2022-23
Department : Civil Engineering
Branch : Civil Engineering
Semester : 2nd
Section : A
Subject Code : 18CV72 & 18CVL76
Subject Name : DRCC & SS & CAD Structures lab


Staff Signature


HOD, CIVIL DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560062


Principal



CITY
ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

DAY	9:00 to 10:00	10:00 to 11:00		11:15 to 12: 15	12:15 to 1:15		2:00 to 3:00	3:00 TO 4:00	4:00 to 5:00	
	I	II		III	IV		V	VI	VII	
MON	18CV72					B R E A K	18CVL76			
TUE		18CV72						18CVL76		
WED							18CV72			
THR										
FRI										
SAT										

MjH

HOD. CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (UGG SEMI)

SEPTEMBER 2022		OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEB 2023		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
WED					2						1	3 rd sem -III CIE
THU	1				3		1				2	
FRI	2				4	Guest lecture	2	Industrial visit			3	
SAT	3		1		5		3				4	
SUN	4		2		6		4		1		5	
MON	5		3		7		5		2	3 rd -II CIE 7 th sem vtU practical exam starts	6	
TUE	6		4	Ayudha pooja	8		6		3		7	
WED	7		5	Vijaya dashami	9		7		4		8	
THU	8		6		10		8		5		9	
FRI	9		7		11	Kanakadasa Jayanthi	9		6		10	
SAT	10	2 nd Saturday holiday	8	2 nd Saturday holiday	12	2 nd Saturday holiday	10	2 nd Saturday holiday	7		11	3 rd Sem LWD 2 nd Saturday holiday
SUN	11		9		13		11		8		12	
MON	12		10	START OF 5 TH SEM / START OF I SEM	14	5 th I CIE	12	5 th sem II CIE	9		13	5 th sem theory exam 3 rd sem practical exam
TUE	13		11		15		13		10	14		
WED	14		12		16		14		11	15		
THU	15		13		17		15		12	16		
FRI	16		14		18		16		13	17		
SAT	17		15		19		17		14	2 nd Saturday holiday	18	
SUN	18		16		20		18		15	Makara Sankranti	19	
MON	19	START OF 7 TH SEMESTER	17	7 th sem-I CIE	21	7 th sem-II CIE	19	7 th sem-III CIE	16	7 th sem vtU theory 5 th sem III CIE	20	
TUE	20		18		22		20		17	5 th sem III CIE	21	
WED	21		19		23		21		18	5 th sem III CIE	22	3 rd sem theory exam
THU	22		20		24		22		19		23	
FRI	23		21		25		23		20		24	
SAT	24	4 th Saturday holiday	22	4 th Saturday holiday	26	4 th Saturday holiday	24	4 th Saturday holiday	21		25	4 th Saturday holiday
SUN	25		23		27		25	Christmas	22		26	
MON	26		24	Naraka chaturdashi	28	3 rd sem-I CIE	26		23		27	
TUE	27		25		29		27		24		28	
WED	28		26	Balipadyami	30		28	Project Phase I	25			
THU	29		27				29		26	Republic Day		
FRI	30		28				30		27	5 th sem LWD		
SAT			29				31	7 th sem LWD	28	4 th Saturday holiday		
SUN			30						29			
MON			31	START OF 3 rd SEMESTER					30	5 th sem exam – practical exam		
TUE			1/11	Rajyotsava					31			

M. J. H.

CITY ENGINEERING COLLEGE
Doddakallappa



CITY
ENGINEERING COLLEGE

DEPT.OF CIVIL ENGINEERING

7TH SEMESTER 2022-23 STUDENTS LIST

SI No	USN	Student Name
1	ICE17CV030	SHAKUNTHALA C M
2	ICE19CV001	APOORVA C
3	ICE19CV003	RAVITEJA S
4	ICE19CV004	VEENA G
5	ICE20CV400	RAJASHEKAR PRASAD V

Mjdh


HOD, CIVIL ENGG DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062.

Course Title: DESIGN OF RCC AND STEEL STRUCTURES

As per Choice Based Credit System (CBCS) scheme]

SEMESTER:VII

Subject Code	17CV72	IA Marks	40
Number of Lecture Hours/Week	04	Exam Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
CREDITS -04		Total Marks- 100	

Course objectives: This course will enable students to

6. Provide basic knowledge in the areas of limit state method and concept of design of RC and Steel structures
7. Identify, formulate and solve engineering problems in RC and Steel Structures
8. Give procedural knowledge to design a system, component or process as per needs and specifications of RC Structures like Retaining wall, Footing, Water tanks, Portal Frames and Steel Structures like Roof Truss, Plate Girder and Gantry Girder.
9. Imbibe the culture of professional and ethical responsibilities by following codal provisions in the analysis, design of RC and Steel Structures.
10. Provide factual knowledge on analysis and design of RC Structural elements, who can participate and succeed in competitive examinations.

Module -1

Footings: Design of rectangular slab type combined footing.

Retaining Walls: Design of cantilever Retaining wall and counter fort retaining wall.

Water Tanks: Design of circular water tanks resting on ground (Rigid and Flexible base).
Design of rectangular water tanks resting on ground. **As per IS: 3370 (Part IV)**

Design of portal frames with fixed and hinged based supports.

L1,L2,L3

Module -2

Roof Truss: Design of roof truss for different cases of loading, forces in members to given.

Plate Girder: Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks

Gantry Girder: Design of gantry girder with all necessary checks

L1,L2,L3

Course Outcomes: After studying this course, students will be able to:

6. Students will acquire the basic knowledge in design of RCC and Steel Structures.
7. Students will have the ability to follow design procedures as per codal provisions and skills to arrive at structurally safe RC and Steel members.


HOD, CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 082

Program Objectives:

- Engineering knowledge
- Problem analysis
- Interpretation of data

Question Paper Pattern:

- Two questions shall be asked from each module. There can be maximum of three subdivisions in each question, if necessary.
 - One full question should be answered from each module.
 - Each question carries 40 marks.
3. Code books – IS 456, IS 800, IS 3370 (Part IV), SP (6) – Steel Tables, shall be referred for designing
 4. The above charts shall be provided during examinations

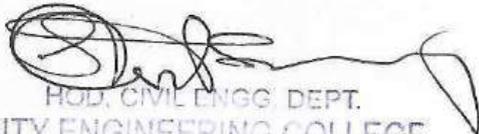
Text Books:

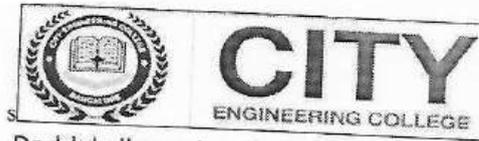
4. N Krishna Raju, “**Structural Design and Drawing of Reinforced Concrete and Steel**”, University Press
5. Subramanian N, “**Design of Steel Structures**”, Oxford university Press, New Delhi
6. K S Duggal, “**Design of Steel Structures**”, Tata McGraw Hill, New Delhi

Reference Books:

6. Charles E Salman, Johnson & Mathas, “**Steel Structure Design and Behaviour**”, Pearson Publications
7. Nether Cot, et.al, “**Behaviour and Design of Steel Structures to EC -III**”, CRC Press
8. P C Verghese, “**Limit State Design of Reinforced Concrete**”, PHI Publications, New Delhi
9. S N Sinha, “**Reinforced Concrete Design**”, McGraw Hill Publication

M.j.H.


HOD, CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE
Doddakailasandra,
BANGALORE - 560 062



Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING

LESSON PLAN FOR ODD SEMESTER FOR ACADEMIC YEAR 2022-23

Course Title: <i>Design of RCC & Steel structures</i>	Course Code : 18CV72
Internal Marks : 40	End Term Marks : 60
Semester : VII	Academic year : 2022-23
Lesson plan Author: Manjunath.K.E	Date : 19/09/2022

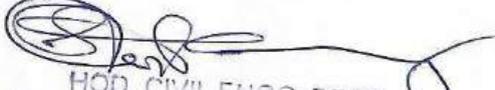
Course Learning Objectives: This course will enable students to;

1. Provide basic knowledge in the areas of limit state method and concept of design of RC and Steel structures
2. Identify, formulate and solve engineering problems in RC and Steel Structures
3. Give procedural knowledge to design a system, component or process as per needs and specifications of RC Structures like Retaining wall, Footing, Water tanks, Portal Frames and Steel Structures like Roof Truss, Plate Girder and Gantry Girder.
4. Imbibe the culture of professional and ethical responsibilities by following codal provisions in the analysis, design of RC and Steel Structures.
5. Provide factual knowledge on analysis and design of RC Structural elements, who can participate and succeed in competitive examinations.

Course Outcomes:

After studying this course, the students will be able to:
Students will acquire the basic knowledge in design of RCC and Steel Structures.
Students will have the ability to follow design procedures as per codal provisions and skills to arrive at structurally safe RC and Steel members.

Week	Days/Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Design of rectangular slab type combined footing.	R, U	CO1
	2	Design of rectangular slab type combined footing.	R, U	CO1
	3	Design of rectangular slab type combined footing.	R, U	CO1
2	1	Design of rectangular slab type combined footing.	R, U	CO1
	2	Design of rectangular slab type combined footing.	R, U	CO1
	3	Design of cantilever Retaining wall	R, U	CO1
3	1	counter fort retaining wall.	R, U	CO1


HOD, CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

2	counter fort retaining wall.	R, U	CO1
3	counter fort retaining wall.	R, U	CO1
4	Design of circular water tanks resting on ground (Rigid and Flexible base). Design of rectangular water tanks resting on ground.	R, U	CO1
5	Design of circular water tanks resting on ground (Rigid and Flexible base). Design of rectangular water tanks resting on ground.	R, U	CO1
6	Design of portal frames with fixed and hinged based supports.	R, U	CO1

MODULE 2

Week	Days/Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
4	1	Design of roof truss for different cases of loading, forces in members to given.	U, A1	CO2
	2	Design of roof truss for different cases of loading, forces in members to given.	U, A1	CO2
	3	Design of roof truss for different cases of loading, forces in members to given.	U, A1	CO2
5	1	Design of roof truss for different cases of loading, forces in members to given.	U, A1	CO2
	2	Design of roof truss for different cases of loading, forces in members to given.	U, A1	CO2
	3	Design of roof truss for different cases of loading, forces in members to given.	U, A1	CO2
6	1	Design of roof truss for different cases of loading, forces in members to given.	U, A1	CO2
	2	Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks	U, A1	CO2
	3	Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks	U, A1	CO2
7	1	Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks	U, A1	CO2
	2	Design of gantry girder with all necessary checks	U, A1	CO2
	3	Design of gantry girder with all necessary checks	U, A1	CO2

Bloom's Taxonomy Level

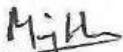
R-Remembering, U-Understanding, A1-Appling, A2-Analysing, E-Evaluating, C-Creating

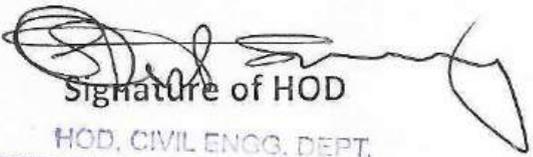
LIST OF TEXT BOOKS

4. N Krishna Raju, "Structural Design and Drawing of Reinforced Concrete and Steel", University Press
5. Subramanian N, "Design of Steel Structures", Oxford university Press, New Delhi
6. K S Duggal, "Design of Steel Structures", Tata McGraw Hill, New Delhi

LIST OF REFERENCE BOOKS

6. Charles E Salman, Johnson & Mathas, "Steel Structure Design and Behaviour", Pearson Publications
7. Nether Cot, et.al, "Behaviour and Design of Steel Structures to EC -III", CRC Press
8. P C Verghese, "Limit State Design of Reinforced Concrete", PHI Publications, New Delhi
9. S N Sinha, "Reinforced Concrete Design", McGraw Hill Publication


Signature of Faculty


Signature of HOD
HOD, CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062.

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

18CV72

Seventh Semester B.E. Degree Examination, July/August 2022

Design of RCG & Steel Structures

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any TWO full questions, choosing ONE full question from each module.
2. Use of IS456, IS-800, SP(6) and steel tables are permitted.*

Module-1

1. Design a combined footing slab beam type for two RCC column A and B separated by a distance of 4 m C/C. Column A is 500×500mm and carries a load of 1250 kN and column B is 600×600mm and carries a load of 1600 kN. Take SBC of soil is 200 kN/m². Use M20 concrete and Fe415 steel. Draw the sectional elevation. (50 Marks)

OR

2. Design a Cantilever retaining wall to retain earth embankment 5 m high above ground level. The density of earth is 18 kN/m³ and its angle of repose is 30°. The embankment is horizontal at its top. The SBC of may be taken as 200 kN/m² and the co-efficient of friction between soil and concrete is 0.5. Adopt M20 grade concrete and Fe415 steel. Also draw cross sectional elevation showing reinforcement details. (50 Marks)

Module-2

3. A line diagram of a roof truss with internal loads and forces in each member are shown in Fig. Q3. Design the various members of the roof truss along with their end connection with bolt of property class 5.6. Also design the bearing plate at support for the reaction and anchor bolts for an uplift force of 15 kN. Also draw the Elevation of truss greater than half plan.

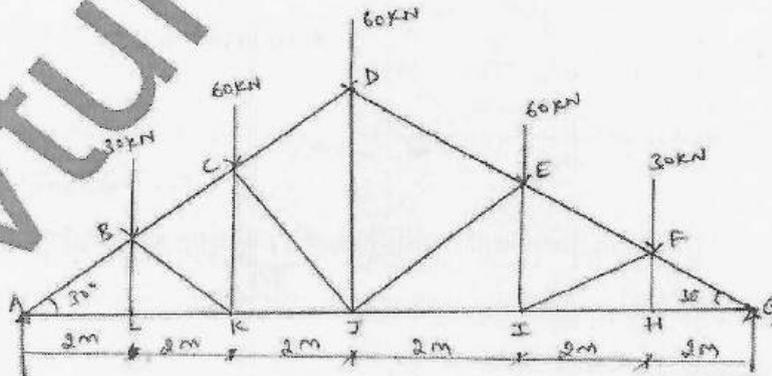


Fig. Q3
1 of 2

Important Note - 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42-8-50, will be treated as malpractice.

18CV72

Members	Length (m)	Force (kN)	Nature of force
AB, GF	2.31	240	C
BC, FE	2.31	210	C
CD, ED	2.31	160.04	C
AI, GH	2.0	207.84	T
LK, HI	2.0	207.84	T
KJ, IJ	2.0	181.82	T
BL, FH	1.154	0	-
BK, FI	2.31	30	C
CK, EI	2.31	15	T
CJ, EJ	3.05	66	C
DJ	3.46	60	C

(50 Marks)

OR

- 4 Design a simply supported gantry girder to carry an electrically operated crane with the following data:
- Span of Crane bridge = 25 m
 - Span of gantry girder = 8 m
 - Wheel base = 3.5 m
 - Crane capacity = 200 kN
 - Weight of crane bridge = 150 kN
 - Weight of trolley = 75 kN
 - Min Hook distance = 1.0 m
 - Weight of rail = 0.30 kN/m
 - Height of rail = 105 mm
- Draw the sectional elevation.

(50 Marks)

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

18CV72

Seventh Semester B.E. Degree Examination, Feb./Mar. 2022

Design of RCC and Steel Structures

Time: 3 hrs.

Max. Marks:100

- Note: 1. Answer any ONE full question each from Module-1 and Module-2.
 2. Use of IS - 456, SP - 16, IS - 800, SP(6) and steel tables is permitted.
 3. Missing data, if any, may be suitably assumed and same must be stated clearly.

Module - 1

- 1 Design slab type or slab beam type combined footing for two columns A and B spaced at 3.5m center to center. Cross section dimensions of column A is 400×400 mm and carries an axial load of 1050kN. Cross section dimensions of column B is 500×500 mm and carries an axial load of 1250kN. Safe bearing capacity of the foundation soil is 240 kN/m^2 . The width of the combined footing is restricted to 2.00m. Use M-25 grade concrete and Fe-415 grade steel. Draw neat sketch of reinforcement details. (50 Marks)

OR

- 2 Design a cantilever retaining wall to retain soil embankment for a height of 3.5m above the average ground level. The back fill is horizontal at the top. The unit weight of soil is 16 kN/m^3 and safe bearing capacity of the formation soil is 150 kN/m^2 . The angle of repose of the soil is 30° and the coefficient of friction between concrete surface and soil may be taken as 0.55. Use M - 20 grade concrete and Fe - 415 steel. Draw a neat sketch of the designed reinforcement details. (50 Marks)

Module - 2

- 3 Design a welded gantry girder to be used in an industrial building for carrying a manually operated over head crane for the data as listed below :
- Crane capacity = 200kN
 - Self weight of crab consisting trolley, motor, hooks, etc. = 40kN
 - Self weight of crane girder excluding crab (trolley) = 200kN
 - Minimum hook approach = 1.20m
 - Wheel base of crab (trolley) = 3.50m
 - Centre to centre distance between gantry rails = 16m (span of crane girder)
 - Centre to centre distance between columns = 8.00 (span for gantry girder)
 - Self weight of rail section = 300N/m
 - Diameter of crane wheel = 150mm
- The steel used is Fe - 410 grade. Draw a neat sketch of the designed details. (50 Marks)

1 of 2

18CV72

4. Design a bolted steel Howe truss having an effective span of 12.00m. The geometry of the truss is as shown in Fig.Q4. The forces induced in the members due to dead load, live load and wind load is tabulated in Table.Q4. Determine the design forces in the members due to various combination of loads as per IS - 800 provisions and hence design principal rafter, principal tie and main sling member with all the necessary safety checks including the reversal of stresses. Also design support joint 'A' by considering the size of supporting reinforced cement concrete column as 300 × 300mm, the design bearing pressure on the concrete is limited to 2N/mm² and the design bond stress between anchor bolt and concrete is limited to 1.2N/mm². Use M16 ordinary black bolts of grade 4.6 for designing member and connection with gusset plate and M25 bolt as anchor bolt at support. List the design details.

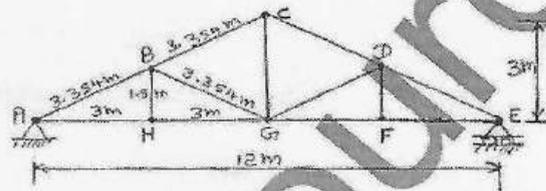


Fig Q4

Members	Dead load kN	Live load kN	Wind load kN
Rafter AB, BC, CD and DE	-58.00	-52.52	+95.60
Tie member AH, HG, GF and FE	+52.00	+47.00	-76.00
Main sling BG, DG	+20.30	+18.40	-63.00

Table Q.4

Note :

- i) (-) indicates compressive force
- ii) (+) indicates tensile force
- iii) Net support reaction ↑ = 45kN (at 'A')
- iv) Net up-lift support reaction ↓ = 55kN (At 'A').

(50 Marks)

2 of 2

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

15CV72

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020 Design of RCC and Steel Structures

Time: 3 hrs.

Max. Marks: 80

- Note: 1. Answer any TWO full questions, choosing ONE full question from each module.
2. Use of IS456, IS800, SP(6)-Steel Table is permitted.
3. Assume any missing data suitably.*

Module-1

- 1 Design a reinforced concrete combined rectangular slab footing for two columns located at 4.5 m apart. The overall sizes of the columns are 400mm × 400mm and 600mm × 600mm and they are transferring 600 kN and 1000 kN respectively. The centre of the lighter column in 0.4m from the property line. The safe bearing capacity of the soil 150 kN/m². Use M20 concrete and Fe 415 steel. Sketch the reinforcement details. (40 Marks)

OR

- 2 Design a cantilever retaining wall to retain an earth embankment with a horizontal top 3.5m above ground level. Density of earth 18 kN/m³, angle of internal friction $\phi = 30^\circ$. SBC of soil is 200 kN/m³. Take coefficient of friction between soil and concrete 0.5, Adopt M20 grade concrete and Fe 415 steel. (40 Marks)

Module-2

- 3 The centre line of a roof truss is as shown in the Fig Q3. The forces in the members of the truss due to dead load, live load and wind load is given below: Design the roof truss member using M16 bolts of property class 4.6. Also design a bearing plate and anchor bolts for a pull of 40 kN. Use M20 grade concrete. Draw to suitable

(i) Elevation of truss greater than half space (ii) Support details.

Member	DL (kN)	LL (kN)	WL (kN)
AB	+14.37	+21.80	-37.32
BC	+11.64	+17.60	-32.08
CD	+12.05	+18.26	-35.90
DE	-5.13	-7.70	+14.70
EC	+2.77	+4.18	-8.42
EB	+2.77	+4.18	9.15
EA	-12.85	-19.36	+31.69
EF	-7.69	-11.61	+15.63

Sign :- + ⇒ Compression
 - ⇒ Tension

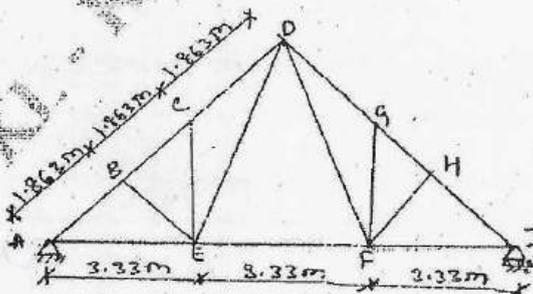


Fig. Q3

(06)

801 (40 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

4 Design a simply supported gantry girder to carry an electrically operated travelling crane with the following details:

- (i) Span of the crane bridge \Rightarrow 25 m
- (ii) Span of the gantry girder \Rightarrow 8 m
- (iii) Wheel base \Rightarrow 3.5 m
- (iv) Crane capacity \Rightarrow 200 kN
- (v) Weight of crane bridge \Rightarrow 150 kN
- (vi) Weight of trolley (crab) \Rightarrow 75 kN
- (vii) Minimum hook distance \Rightarrow 1.0 m
- (viii) Weight of rail \Rightarrow 0.30 kN/m
- (ix) Height of rail \Rightarrow 105 mm

Draw neatly cross section of gantry girder showing all details. Also draw side view.

(40 Marks)

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

15CV72

Seventh Semester B.E. Degree Examination, June/July 2019 Design of RCC and Steel Structures

Time: 3 hrs.

Max. Marks: 80

- Note: 1. Answer any TWO full questions, choosing one full question from each module.
2. Use of IS456, IS800, IS3370, SP(6)-steel tables is permitted.
3. Any missing data may be assumed suitably.

Module - 1

- 1 a. Name the different types of retaining walls. (04 Marks)
b. Design a combined footing for two interior columns carrying axial loads 1000kN and 1200kN. Column A is 400mm × 400mm in size and column B is 450mm in diameter. They are reinforced with 20mm bars and are spaced 4m centre to centre as for a bearing capacity of the soil is 120 kN/m². Use M20 mix and Fe 415 grade steel. Sketch it. (36 Marks)

OR

- 2 a. Name the different classification of liquid retaining structures. (04 Marks)
b. Roof of a 8m wide hall is supported on a portal frame spaced at 4m intervals. The height of the portal frame is 4m. The continuous slab is 120mm thick. Live load of roof is 1.5 kN/m², SBC of soil is 150 kN/m². The columns are connected with a plinth beam and the base of the column may be assumed fixed. Design the slab, column, beam members for the columns of the portal frame. Use M20 and Fe415 grade steel. Sketch the details. (36 Marks)

Module - 2

- 3 a. Name any 4 various types of roof trusses. (04 Marks)
b. Design a welded plate girder for an effective span of 20m to support a Udl of 80 kN/m in addition to a pair of point loads of 870 kN each of 5m from end of beam (10m apart @ center). Design the plate girder. (36 Marks)

OR

- 4 a. What are the advantages of plate girder over trusses? (04 Marks)
b. Design a simply supported crane girder for the following data. The girder is electrically operated. Take yield stress of steel as 250MPa.
i) Span of the crane girder = 20m
ii) Span of the gantry girder = 7m
iii) Capacity of the crane = 250kN
iv) Self weight of crane excluding crab = 200kN
v) Weight of crab = 60kN
vi) Wheel base distance = 3.4m
vii) Minimum hook approach = 1.1m
viii) Self weight of rail = 0.3 kN/m
ix) Height of rail = 75mm. (36 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

CBCS SCHEME

USN

1 V E 1 6 C V 0 0 7

15CV72

Seventh Semester B.E. Degree Examination, Aug./Sept.2020 Design of RCC and Steel Structures

Time: 3 hrs.

Max. Marks: 80

Note: 1. Answer any TWO full questions, choosing ONE full question from each module.
2. Use of IS-456, IS-800, SP(16), SP(6) and steel tables are permitted.

Module-1

- 1 Design a slab type rectangular combined footing for two columns, A = 350 mm × 350 mm and B = 400 mm and 400 mm in size to carry axial service load of 600 kN and 900 kN respectively. The columns are spaced at 3.6 m centre to centre. SBC of soil is 175 kN/m². The property line is 0.74m from centre of column A. Use M20 grade concrete and Fe-415 grade steel. (40 Marks)

OR

- 2 Design a single bay portal frame, fixed at the base for the following data:
Effective span of portal frame = 10 m
Spacing of portal frame = 4 m
Height of column above footing = 5.5 m (effective)
Thickness of slab to be adopted = 150 mm
Live load on slab = 1.6 kN/m²
Floor finish = 0.75 kN/m²
SBC of soil = 200 kN/m²
Use M20 grade concrete and Fe 415 steel. Design the slab, beam, column and footing. (40 Marks)

Module-2

- 3 The centre line of a roof truss is as shown in Fig.Q3. The magnitude and nature of forces under service conditions are :
Top Chord members = 120 kN Compression
Bottom Chord members = 100 kN Tension
Interior members = 60 kN Tension and 50 kN Compression
For all the interior members use similar single angle sections. Design all the members and joints using M₁₆ turned bolts of grade 4.6. Also design bearing plate, base plate and anchor bolts to connect the truss to an RCC column 300 mm × 300 mm of M₂₀ grade concrete.

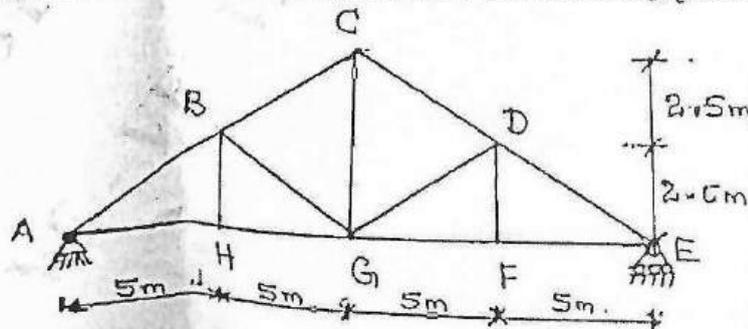


Fig.Q3

(40 Marks)

1 of 2

Scanned with CamScanner

Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or expressions written on pg. 42, 48 - 50, will be treated as malpractice.

15CV72

OR

- 4 Design a welded plate girder, effective span of 18 meters is simply supported at its ends. It carries a uniformly distributed load of 60 kN/m in addition to two point loads each of magnitude 400 kN placed at one third span points. Design:
- (i) Cross section of plate girder at midspan.
 - (ii) End and intermediate stiffeners
 - (iii) Welded connection between flange and web
 - (iv) Welded connection between web and stiffeners

(40 Marks)

DESIGN OF RCC & STEEL STRUCTURES

Assignment questions

1. An RC portal frame with hinged base is required to suit the following details

Spacing of portal frames 4.5m c/c, Height of columns 4.5 m, Distance b/w column centers 10m, Live load on roof 1.5kN/m^2 , The RC slab is continuous over the portal frame and SBC of soil at site 200kN/m^2 , Adopt M20 and Fe 500 grade HYSD bars. Design the slab, portal frame and foundations

Draw the c/s of the continuous slab showing reinforcement details

s/n of the portal frame showing reinforcement in transom, columns hinge and footing.

2. The roof of 8m wide assembly hall is supported on portal frames spaced at 4m interval. The height of the portal frame is 4m. The continuous slab is 120mm thick. Live load on roof is 1.5kN/m^2 SBC of soil is 150kN/m^2 . The columns are connected with a plinth beam and the base of column may be assumed as fixed. Design the column and beam members and a suitable foundation footing for the column of the portal frame. Adopt M30 grade concrete and Fe 415 HYSD bars
Draw the C/S of beam and Column member

3. Design the portal frame of a warehouse using following data

Length of transom 12m

Column height 6m

Spacing of frame 3m

Thickness of roof slab 150 mm

Live load on roof slab 2kN/m^2

Materials used M25 and Fe 250

Sketch reinforcement details

4. An RC portal frame is used for covering a hall 10m X 30m. Assuming a hinged base for the columns. Design the continuous slab and portal frame using the following

Distance B/W center line of columns 10m

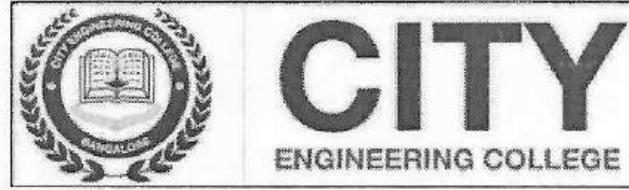
Spacing of portals 3m

Height of the column 5m

SBC of soil 200kN/m^2

Materials Fe 415 and M25

Sketch the reinforcement details



Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING
FIRST INTERNAL TEST

e-mail: manjunathakemanju@gmail.com

Phone no: 7259897112

VII SEM

SUBJECT: DESIGN OF RCC AND STEEL STRUCTURES

DATE: 27/10/2020

MAX MARKS: 50

SUB CODE: ~~15/17CV72~~ - 18CV72

TIME: 3:00 TO 4:30PM

Note: Answer all Questions selecting any ONE FULL question from each part.

Q No.	Questions	Marks	CO's	BT Level
-------	-----------	-------	------	----------

PART-A

1	Design slab type combined footing for two columns A & B separated by a distance 4 m c/c. column A is 300 X 300 mm and carries a load of 800kN and column B is 400 X 400 mm and carries a load of 1200kN. Take SBC of soil 180kN/m ² . use M25 and Fe 415 steel. Draw sectional elevation, plan and cross section showing reinforcement details Take width of footing as 1.8m.	50	CO1	L1,L2, L3,L4,L5
---	--	----	-----	--------------------

Or

2	Design a cantilever type retaining wall to retain the soil for height of 4m above the groundline. SBC of the soil is 180kN/m ² density of soil is 16kN/m ³ angle of repose is 30°. coefficient of friction is 0.45 use M25 and Fe 415 steel Draw c/s of retaining wall, longitudinal s/n of stem and base slab showing all steel about 3m length, s/n showing the detail of steel in toe and heel slab	10	CO1	L1,L2, L3,L4,L5
---	---	----	-----	--------------------

Bloom Taxonomy Levels (BTL):

L1-Remembering, L2-Understanding, L3-Appling, L4-Analysing, L5-Evaluating, L6-Creating

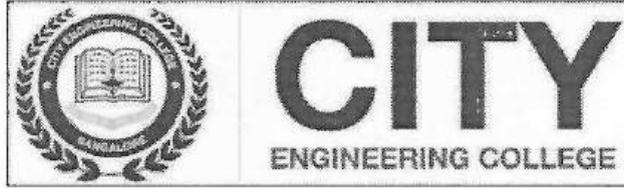
Course outcome's (CO's):

CO1: Provides basic knowledge in the areas of limit state method and concept of design of RC and steel structure

Q. No.	Detail of the Answer	Marks Distribution	Total Marks
2)	<p> $\text{depth} = 1.25\text{m}$ $b_1 = 3.15\text{m}$ $K_a = 0.33$ $H = 5.25\text{m}$ $h = 4.81\text{m}$ </p> <p> $P_n = 60.8\text{ kN}$ $M_u = 146.8\text{ kN}\cdot\text{m}$ $d = 206.28$ $D = 300$ </p> <p> $\Sigma W = 203.18\text{ kN}$ $\Sigma M = 402.81\text{ kN}\cdot\text{m}$ $P_w = 72.76\text{ kN}$ $M_0 = 129.3$ $\bar{x} = 1.36\text{m}$ $\text{FOS} = 1.4$ $A_{st} = 360\text{ mm}^2$ $D.S = 360\text{ mm}^2$ </p> <p> <u>Shear</u> $P_t = 0.81$ $\tau_c = 0.583\text{ N/mm}^2$ $h_1 = 3.92\text{m}$ <u>Toe</u> $M_u = 61.29\text{ kN}\cdot\text{m}$ $d = 133.28\text{ mm}$ $A_{st} = 455.79$ $\tau_v = 0.29\text{ N/mm}^2$ $V_u = 112.08\text{ kN}$ $M = 64.29\text{ kN}\cdot\text{m}$ $A_{st} = 725.70\text{ mm}^2$ $V_u = 93.5\text{ kN}$ </p>		50

HJK


 HOD, CIVIL ENGG. DEPT.
 CITY ENGINEERING COLLEGE
 Sasandra,
 Mangalore



Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING
SECOND INTERNAL TEST

VII SEM

SUBJECT: DESIGN OF RCC AND STEEL STRUCTURES

DATE: 12/12/2022

MAX MARKS: 50

SUB CODE: 18CV72

TIME: 2:30 TO 4:00PM

*Note: Answer any ONE FULL question.
Assume the missing data as per code book*

Q	Questions	Marks	CO's	BT Level
---	-----------	-------	------	----------

PART-A

1	<p>An RC portal frame with hinged base is required to suit the following details Spacing of portal frames 4.5m c/c, Height of columns 4.5 m, Distance b/w column centres 10m. Live load on roof 1.5kN/m², The RC slab is continuous over the portal frame and SBC of soil at site 200kN/m², Adopt M20 and Fe 500 grade HYSD bars. Design the slab, portal frame and foundations</p> <p>Draw the c/s of the continues slab showing reinforcement details s/n of the portal frame showing reinforcement in transom, columns hinge and footing.</p>	50	CO1	L1,L2, L3,L4,L5
---	--	----	-----	--------------------

Or

2	<p>The roof of 8m wide assembly hall is supported on portal frames spaces at 4m interval. The height of the portal frame is 4m. the continues slab is 120mm thick. Live load on roof is 1.5 kN/m² SBC of soil is 150 kN/m². The columns are connected with a plinth beam and the base of column may be assumed as fixed. Design the column and beam members and a suitable foundation footing for the column of the portal frame. Adopt M30 grade concrete and Fe 415 HYSD bars</p> <p>Draw the C/S of beam and Column member and section of portal frame showing all components</p>	50	CO1	L1,L2, L3,L4,L5
---	--	----	-----	--------------------

Bloom Taxonomy Levels (BTL):

L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating

Course outcome's (CO's):

CO1: Provides basic knowledge in the areas of limit state method and concept of design of RC and steel structure

SCHEME OF EVALUATION for TEST

Subject with code: DRSS 18CV72

SEMESTER: 7th

Part	Q No.	Solution	Marks allotted
1	1	$d = 0.869m$ $H = 7m$ $L = 3m$ c/c $b_1 = 4.9m$ $B.M. = \frac{wL^2}{12}$ $K_a = 0.204$ $w_u = 46.43 \text{ kN/m}$ $M_u = 34.82 \text{ kN-m}$ $d = 100.4 \text{ mm}$ $D = 160.46 \text{ mm}$ $\Sigma W = 424.96 \text{ kN}$ $\Sigma M = 1334.85 \text{ kN-m}$ $P_H = 115.24 \text{ kN}$ $\bar{x} = 2.34 \text{ m}$ $M_o = 268.9 \text{ kN-m}$ $\sigma_{max} = 105.35$ $\sigma_{min} = 80.34$ $A_{st} = 390 \text{ mm}^2$ $T_v = 0.315$ $d = 290$ $D = 350 \text{ mm}$ $M_u = 39.87 \text{ kN-m}$ $A_{st} = 870.84 \text{ mm}^2$ $v = 95.69 \text{ kN}$ $T_c = 0.48 \text{ p/mm}^2$ $V_u = 131.88$ $T_c = 0.35 \text{ p/mm}^2$ $D = 150 \text{ mm}$ $b = 325 \text{ mm}$ $P_h = 293.5 \text{ kN}$ diagram	50

MJK


HOD, CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE.

2 2.

$$p = w(H-1)$$

$$\text{step} = m = 10.98 \text{ m}$$

$$d = m \sigma_{bc}$$

$$K = 0.383$$

$$K = 0.33$$

$$J = 1.42$$

$$\phi = 1.42$$

$$P = 19.62 \text{ kN/m}^2$$

$$EK = 0.4171$$

$$DF = \begin{matrix} 0.4 \\ 0.6 \end{matrix}$$

$$BM = 42.58 \text{ kN-m}$$

$$T = 39.24 \text{ kN}$$

$$T = 58.86 \text{ kN}$$

$$M = 4.905 \text{ kN-m}$$

$$d = 180 \text{ mm}$$

$$D = 220 \text{ mm}$$

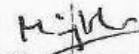
$$M = 43.914 \text{ kN-m}$$

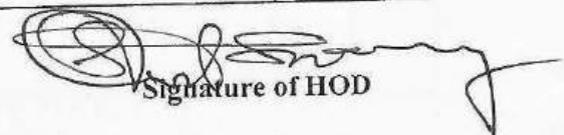
$$x_c = 70 \text{ mm}$$

$$A_{st} = 260.6 \text{ mm}^2$$

diagram

50


Signature of Teacher


Signature of HOD



Doddakallasandra, Bangalore-560061
DEPARTMENT OF CIVIL ENGINEERING
THIRD INTERNAL TEST

VII SEM
 MAX MARKS: 50

SUBJECT: DESIGN OF RCC AND STEEL STRUCTURES
SUB CODE: 18CV72

DATE: 28/12/2022
 TIME: 2:30 TO 4:00PM

*Note: Answer any ONE FULL question.
 Assume the missing data as per code book*

Q o.	Questions	Marks	CO's	BT Level
---------	-----------	-------	------	-------------

PART -A

1	An RC portal frame with hinged base is required to suit the following details Spacing of portal frames 4.5m c/c, Height of columns 4.5 m, Distance b/w column centres 10m, Live load on roof 1.5kN/m ² , The RC slab is continuous over the portal frame and SBC of soil at site 200kN/m ² , Adopt M20 and Fe 500 grade HYSD bars. Design the slab, portal frame and foundations Draw the c/s of the continues slab showing reinforcement details s/n of the portal frame showing reinforcement in transom, columns hinge and footing.	50	CO1	L1,L2, L3,L4,L5
---	---	----	-----	--------------------

Or

2	The roof of 8m wide assembly hall is supported on portal frames spaces at 4m interval. The height of the portal frame is 4m. the continues slab is 120mm thick. Live load on roof is 1.5 kN/m ² SBC of soil is 150 kN/m ² . The columns are connected with a plinth beam and the base of column may be assumed as fixed. Design the column and beam members and a suitable foundation footing for the column of the portal frame. Adopt M30 grade concrete and Fe 415 HYSD bars Draw the C/S of beam and Column member and section of portal frame showing all components	50	CO1	L1,L2, L3,L4,L5
---	--	----	-----	--------------------

Bloom Taxonomy Levels (BTL):

L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating

Course outcome's (CO's):

CO1: Provides basic knowledge in the areas of limit state method and concept of design of RC and steel structure

CITY ENGINEERING COLLEGE
DEPARTMENT OF ... Civil Eng

SCHEME FOR VALUATION

Semester & Section: 7th Internal Test 3rd IA

Date:

Question No.	Details of the Answer	Marks Distribution	Total Marks
1	<p> $T.L = 9 \text{ KN/m}$ $R_A = 1462 \text{ KN}$ $V = 1462 \text{ KN}$ $M = 13158 \text{ KN-m}$ $b_f = 657 \text{ mm}$ $t_f = 60 \text{ mm}$ $M_d = 21261.36 \text{ KN-m}$ $\tau_D = 82.83 \text{ N/mm}^2$ $P_{ds} = 802.93$ $R_D = 2240.2 \text{ KN}$ $A_{ct} = 8763.04 \text{ mm}^2$ $\lambda = 18.36$ $F_{LD} = 110454 \text{ KN}$ $P_{dL} = 668.48 \text{ N/mm}^2$ $r_2 = 36.91 \text{ mm}$ $d_c = 668.48 \text{ N/mm}^2$ $h = 120 \text{ mm}$ $F_{L0} = 777.29 \text{ KN}$ </p>		50

H.K.
Staff

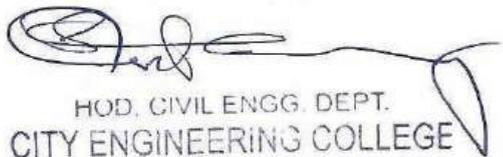

 HOD, CIVIL DEPT.
 CITY ENGINEERING COLLEGE
 Doddakannur, Bangalore

Question No.	Details of the Answer	Marks Distribution	Total Marks
2	<p>TL 230 kN. SW = 200 kN. $\phi = 875 \text{ mm}$</p> <p>$\frac{wL^2}{8} = 15.52 \text{ kN/m}$ $M_c = 441.82 \text{ kN-m}$ $R_c = 334.36 \text{ kN}$ $R_D = 137.68 \text{ kN}$ $\frac{wL}{2} = 10.38 \text{ kN}$ $V_u = 334.36$</p> <p>LF = 23 kN. $\frac{L}{12} = 400 \text{ mm}$ $\frac{L}{30} = 200 \text{ mm}$</p> <p>$I = 7.07 \times 10^8 \text{ mm}^4$ $\bar{y} = 4.79 \text{ mm}$ <u>$I_{WB} = 500$</u> $M_D = 164.1 \text{ kN}$ $k_f = 507.6$ $C_c = 1.046$ $M_c = 1510.88$ $\gamma_{22} = 0.868$ $I_{yy} = 1935 \times 10^6 \text{ mm}^4$ $A V_u = 411.58 \text{ kN}$ $\bar{y} = 170 \text{ mm}$</p>		50

Hjh

B. E. CIVIL ENGINEERING			
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)			
SEMESTER - VII			
COMPUTER AIDED DETAILING OF STRUCTURES			
Course Code	18CVL76	CIE Marks	40
Teaching Hours/Week(L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03
Course Learning Objectives: This course will enable students to			
<ol style="list-style-type: none"> 1. Be aware of the Scale Factors, Sections of drawings, 2. Draft the detailing of RC and Steel Structural member. 			
Module -1 Detailing of RCC Structures			
<ul style="list-style-type: none"> • Beams – Simply supported, Cantilever and Continuous. • Slab – One way, Two way and One-way continuous. • Staircase – Doglegged • Cantilever Retaining wall • Counter Fort Retaining wall • Circular Water Tank, Rectangular Water Tank. 			
Module -2 Detailing of Steel Structures			
<ol style="list-style-type: none"> 1. Connections – Beam to beam, Beam to Column by Bolted and Welded Connections. 2. Built-up Columns with lacings and battens 3. Column bases and Gusseted bases with bolted and welded connections. 4. Roof Truss – Welded and Bolted 5. Welded Plate girder 6. Gantry Girder 			
Course outcomes: After studying this course, students will be able to:			
<ul style="list-style-type: none"> • Prepare detailed working drawings 			
Question paper pattern:			
<ol style="list-style-type: none"> 1. Two questions shall be asked from each Module. 2. One full question should be answered from each Module. 3. Each question carries 50 marks. 			
Textbooks:			
<ol style="list-style-type: none"> 1. N Krishna Raju, "Structural Design and Drawing of Reinforced Concrete and Steel", University Press 2. Krishna Murthy, "Structural Design and Drawing – Concrete Structures", CBS Publishers, New Delhi 			
Reference Books:			
<ol style="list-style-type: none"> 1. SP 34: Handbook on Concrete Reinforcement and Detailing, Bureau of Indian Standards. 2. IS 13920, Ductile Design And Detailing Of Reinforced Concrete Structures Subjected To Seismic Forces - Code Of Practice, Bureau of Indian Standard. 			

M.K.H.


 HOD, CIVIL ENGG. DEPT.
 CITY ENGINEERING COLLEGE
 Doddakallasandra,
 BANGALORE - 560 062



DEPARTMENT OF CE

LESSON PLAN FOR ODD SEMESTER FOR ACADEMIC YEAR 2022- 23

Lab Title: Computer Aided Detailing of Structures	Course Code: 18CVL76
Total contact hours: L: T:P:S :: 3:0:0:0	End Term Marks: 40
Internal Marks: 60	
Semester: VII	Academic year: 2022-23
Lesson plan Author: Manjunath K E	Date :19/09/2022

Course Objective:

This course will enable students to

1. Be aware of the Scale Factors, Sections of drawings
2. Draft the detailing of RC and Steel Structural member.

Course Outcomes:

- After studying this course, students will be able to: •
- Prepare detailed working drawings

MODULE1

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Beams – Simply supported, Cantilever and Continuous.	L1, L2, L3	CO1
	2			
	3			
2	1	Slab – One way, Two way and One-way continuous.	L1, L2, L3	CO1
	2			
	3			
3	1	Staircase – Doglegged	L1, L2, L3	CO1
	2			
	3			
4	1	Cantilever Retaining wall	L1, L2, L3	CO1
	2			
	3			
5	1	Counter Fort Retaining wall	L1, L2, L3	CO1
	2			
	3			
6	1	Circular Water Tank, Rectangular Water Tank.	L1, L2, L3	CO1
	2			
	3			

MODULE 2

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
7	1	Connections – Beam to beam, Beam to Column by Bolted and Welded Connections.	L1, L2, L3	CO1
	2			
	3			
8	1	Built-up Columns with lacings and battens	L1, L2, L3	CO1
	2			
	3			
9	1	Column bases and Gusseted bases with bolted and welded connections	L1, L2, L3	CO1
	2			
	3			
10	1	Roof Truss – Welded and Bolted	L1, L2, L3	CO1
	2			
	3			
11	1	Beams with Bolted and Welded	L1, L2, L3	CO1
	2			
	3			
12	1	Gantry Girder	L1, L2, L3	CO1
	2			
	3			

Bloom's Taxonomy Level

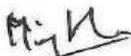
R-Remembering U-Understanding A1-Appling A2-Analysing E-Evaluating C-Creating

Text Books:

1. N Krishna Raju, "Structural Design and Drawing of Reinforced Concrete and Steel", University Press
2. Krishna Murthy, "Structural Design and Drawing – Concrete Structures", CBS Publishers, New Delhi

Reference Books:

1. SP 34: Handbook on Concrete Reinforcement and Detailing, Bureau of Indian Standards
2. IS 13920:2016, Ductile Design And Detailing Of Reinforced Concrete Structures Subjected To Seismic Forces - Code Of Practice, Bureau of Indian Standard


Signature of Faculty


Signature of HOD
HOD, CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062



CITY
ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CIRCULAR

Ref. No: CEC/CSE/DAC/2022-2023/02

Date: 03-02-2023

All the members of Department Advisory Committee are informed to attend a meeting which will be held as follows

Date: 10/02/2023

Time: 10.30 AM

Venue: LAB C108

Agenda:

- Certification course for 3rd year
- Organizing workshop for final year
- Conduction of Project Exhibition
- Industrial Visit
- Conduction of guest lectures/ workshops

Dr. Sowmya Naik P T

HOD



CITY
ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Department Advisory Committee Meeting

Date: 10/02/2023

Time: 10.30 AM

Venue: Room No. C108

DAC Members Present:

Sl. No	Member Name	Designation	Role	Sign
1	Dr. Sowmya Naik P T	HOD	Convenor	
2	Dr. Nandakumar A N	Professor	Member	
3	Mrs. Ambika P R	Assistant Professor	Co-Convenor	
4	Mrs. Laxmi M C	Assistant Professor	Member	
5	Mr. Girish G A	Assistant Professor	Member	
6	Mrs. Archana Bhat	Assistant Professor	Member	
7	Mrs. Shashikala H C	Assistant Professor	Member	
8	Mr. Vinodh Kumar S	Assistant Professor	Member	
9	Mrs. Sangeeta Uranakar	Assistant Professor	Member	
10	Mr. Narasimha Prasad K L	Project Manager, Accenture Services Pvt. Ltd	Alumni (Industry Expert)	
11	Mr. Mujtaba Nayaz	Data Analyst, Infosys	Alumni	

The Department Advisory Committee meeting was conducted at Department of CSE, on 10th February, 2023, at 10:30 am.

Agenda of the Meeting:

- Certification course for 3rd year
- Organizing workshop for final year
- Conduction of Project Exhibition
- Industrial Visit
- Conduction of guest lectures/ workshops



Minutes of Meeting:

In the Department Advisory Committee meeting, an overview of the department was presented, emphasizing student achievements, result analysis, and faculty accomplishments. The members discussed various suggestions for improvement and reviewed the meeting agenda.

The Committee proposed the following items for inclusion in the agenda:

- A certificate course on data analytics for third-year students was recommended. This course would not only enhance their programming skills but also deepen their understanding of data analytics concepts.
- It was agreed to organize a workshop on the Internet of Things (IoT) for final-year students.
- Second-year students can be involved in technical activities and encouraged to attend guest lectures or seminars.
- A project exhibition was proposed to give final-year students an opportunity to showcase their projects.
- To increase awareness of current technologies, the committee suggested organizing workshops, guest lectures, and hands-on sessions.


Dr. Sowmya Naik P T
HOD & Convenor



ವಿಶ್ವೇಶ್ವರಯ್ಯತಾಂತ್ರಿಕವಿಶ್ವವಿದ್ಯಾಲಯ

ವಿಜಯಲಢಿನಿಯಮಂ೯೯೪ ರಲಡಿಲರಿಕರ್ನಾಟಕಸರ್ಕಾರದಿಂದಸ್ಥಾಪಿತವಾದರಾಜ್ಯವಿಶ್ವವಿದ್ಯಾಲಯ

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

State University of Government of Karnataka Established as per the VTU Act, 1994 "JnanaSangama" Belagavi-590018, Karnataka, India

Prof. B. E. Rangaswamy, Ph.D

REGISTRAR

Phone: (0831) 2498100

Fax: (0831) 2405467

REF: VTU/BGM/GC/2023/ 712

DATE: 9 MAY 2023

Revised-NOTIFICATION

Subject: Tentative Academic Calendar of II Semester B.E./B.Tech., B.Arch and B.Plan and IV semester B.E./B.Tech., programs of University regarding...

Reference: Hon'ble Vice-Chancellor's approval dated: 9 MAY 2023

The computer-Aided Engineering Drawing (BCEDK103) examinations of II semester B.E./B.Tech., programs are scheduled between 15.05.2023 to 24.05.2023. A revised Academic Calendar (Tentative) of II Semester B.E./B.Tech., B.Arch and B.Plan and IV semester B.E./B.Tech., programs of the University for the academic year 2022-23 are hereby notified as mentioned below;

(Tentative) Academic Calendar for semesters of II semester B.E./B.Tech./B.Arch./B.Plan and IV semester B.E./B.Tech., Programs for AY 2022-23 (May 2023)			
	II Semester B.E./B.Tech. (2022 scheme)	II Semester B. Arch, B. Plan (2021 scheme)	IV Semester B.E./ B.Tech (2021 scheme)
Commencement of the semester	25.05.2023	17.05.2023	17.05.2023
Internship	-----	-----	17.05.2023 To 03.06.2023
Commencement of the Classes	25.05.2023	17.05.2023	05.06.2023
Last Working day of the Semester	09.09.2023	31.08.2023	16.09.2023
Practical Examination/Viva Examination	11.09.2023 To 20.09.2023	01.09.2023 To 08.09.2023	19.09.2023 To 30.09.2023
Theory Examinations	21.09.2023 To 21.10.2023	11.09.2023 To 27.09.2023	03.10.2023 To 20.10.2023
Commencement of next Semester	25.10.2023	09.10.2023	25.10.2023

R

Annexure-I
Tentative Academic Calendar for academic year 2022-23

	II sem B.Sc.(Hon)	IV sem B.Sc (Hon)	VI sem B.E./B.Tech	VI sem B.Plan	#VI sem B.Arch.
Commencement of semester Classes	06.03.2023 ✓	20.03.2023 ✓	20.03.2023 ✓	20.03.2023 ✓	20.03.2023 ✓
Last Working day of the Semester	30.06.2023 ✓	10.07.2023 ✓	10.07.2023 ✓	10.07.2023 ✓	10.07.2023 ✓
Practical Examination/Viva Examination	03.07.2023	11.07.2023 ✓	11.07.2023 ✓	11.07.2023 ✓	11.07.2023 ✓
	To 07.07.2023 ✓	To 15.07.2023	To 21.07.2023 ✓	To 21.07.2023 ✓	To 21.07.2023 ✓
Theory Examinations	10.07.2023	17.07.2023	24.07.2023 ✓	24.07.2023 ✓	24.07.2023 ✓
	To 25.07.2023 ✓	To 31.07.2023	To 12.08.2023 ✓	To 12.08.2023 ✓	To 12.08.2023 ✓
Internship	-----	-----	04 weeks 09.09.2023	06 weeks 16.09.2023	-----
Commencement of next Semester	01.08.2023 ✓	01.08.2023	11.09.2023	19.09.2023	16.08.2023 ✓

Academic calendar already notified vide VTU/BGM/ACA/2022-23/6889, dated 15.02.2023

Please Note:

- The academic sessions should commence on the **date mentioned** above.
- If required, the college can also plan to have extra classes on Saturday(1st and 3rd) and Sundays full day to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges**. If any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- If any clarification/correction, please email to - sbhalbhavi@vtu.ac.in

REGISTRAR





ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

(ವಿಜಯ ಅಧಿನಿಯಮ ೧೯೯೪ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)
"InanaSangama" Belagavi-590018, Karnataka, India

Prof. Dr. B. E. Rangaswamy, Ph.D.
REGISTRAR

Phone: (0831) 2498100
Fax : (0831) 2405467

REF: VTU/BGM/ACA/2022-23/ 6566

DATE: 3 FEB 2023

NOTIFICATION

Subject: Tentative Academic Calendar of VIII semesters of B.E./ B.Tech.,
B.Arch., B. Plan programs of University regarding...
Reference: Hon'ble Vice-Chancellor's approval dated: 03.02.2023

The tentative academic calendar concerned to VIII semesters of B.E./B.Tech.,
B. Arch., and B. Plan programs of University for academic year 2022-23 are hereby
notified as mentioned below;

(Tentative) Academic Calendar for semesters of all VIII Semester UG Programs (Feb 2023)			
	B.E./B.Tech.	B.Arch	B.Plan
Commencement of 8 th semester Classes	13.02.2023	13.02.2023	13.02.2023
Last Working day of 8 th Semester	13.05.2023	13.05.2023	13.05.2023
Practical Examination/Viva Examination	05.06.2023 To 13.06.2023	16.05.2023 To 26.05.2023	----
Theory Examinations	16.05.2023 To 01.06.2023	29.05.2023 To 10.06.2023	16.05.2023 To 01.06.2023
Commencement of next Semester	---	-----	-----

Please Note:

- The academic sessions for VIII semester should commence on the date mentioned above.
- The Institute needs to function for six days a week with Saturday being half working day. #if required, the college can also plan to have extra classes on Saturday afternoons and Sundays full day to complete academic activities within the duration mentioned. This will facilitate the final year students for appearing competitive examination for their career and also helps in seeking admission abroad.



CITY ENGINEERING COLLEGE, BANGALURU-560061. ACADEMIC CALENDAR 2022-23 Even SEM

DAY	May 2023		June 2023		July 2023		Aug 2023		Sept 2023	
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON	1									
TUE	2									
WED	3						1			
THU	4		1				2			
FRI	5		2				3			
SAT	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday	4		1	Start of II sem Practical
SUN	7		4		2		5	1st Saturday holiday	2	1st Saturday holiday
MON	8		5	4th sem start 8th sem Practical	3		6		3	
TUE	9		6		4		7		4	
WED	10		7		5		8		5	
THU	11		8		6		9		6	
FRI	12		9		7		10		7	
SAT	13		10		8		11		8	
SUN	14		11		9		12		9	II sem last working day
MON	15		12		10	VI SEM LAST WORKING day	13		10	
TUE	16	8th sem theory exam	13		11	6 TH sem practical exam	14		11	Start of II sem Practical exam
WED	17		14		12		15	Independence day	12	
THU	18	8th sem theory exam	15		13		16		13	
FRI	19		16		14		17		14	
SAT	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday	18		15	IV sem last working day
SUN	21		18		16	3rd Saturday holiday	19	3rd Saturday holiday	16	3rd Saturday holiday
MON	22		19		17		20		17	
TUE	23		20		18		21		18	Ganesha festival
WED	24		21		19		22		19	Start of IV sem Practical
THU	25	II SEM START IV sem Internship	22		20		23		20	
FRI	26		23		21		24		21	Start of II sem Theory exam
SAT	27		24		22		25		22	
SUN	28		25		23		26		23	
MON	29		26		24	6 TH sem Theory exam	27		24	
TUE	30		27		25		28		25	
WED	31		28		26		29		26	
THU			29	Bakrid	27		30		27	
FRI			30		28		31		28	Id Milad
SAT					29	Moharam			29	
SUN					30				30	
MON					31				31	
									3/10	Start of IV sem Theory

Handwritten signature



CITY ENGINEERING COLLEGE

Department of CSE

COE- 2022-23 - 6th SEM

	March 2023		Aril 2023		May 2023		June 2023		July 2023	
DAY	Date		Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	May day				
TUE					2					
WED	1				3	6 th Sem – I CIE				
THU	2				4		1			
FRI	3				5		2			
SAT	4		1	1st Saturday holiday	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday
SUN	5		2		7		4		2	
MON	6		3		8	8 th Sem- Project Exhibition	5	6 th Sem – II CIE	3	
TUE	7		4		9		6		4	
WED	8		5		10		7		5	
THU	9		6		11		8		6	6 th Sem – III CIE
FRI	10		7	Good Friday	12		9		7	
SAT	11		8		13		10	6 th Sem - PTM	8	
SUN	12		9		14		11		9	
MON	13		10		15		12	Workshop for 6 th sem	10	6th Sem Last Working Day
TUE	14		11		16	8th sem theory exam	13		11	6 th sem practical exam
WED	15		12		17	IV sem Internship	14		12	
THU	16		13		18	8th sem theory exam	15		13	
FRI	17		14	Ambedkar Jayanthi	19		16		14	
SAT	18		15	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday
SUN	19		16		21		18		16	
MON	20	6th Sem Starts	17		22		19		17	
TUE	21		18		23		20		18	
WED	22	Ugadi	19		24		21		19	
THU	23		20		25		22		20	
FRI	24		21		26		23		21	
SAT	25		22	Ramzan	27		24	Industrial Visit	22	
SUN	26		23		28		25		23	
MON	27		24		29		26		24	6TH sem Theory exam
TUE	28	Sports and	25		30		27		25	
WED	29	Cultural Events	26		31		28		26	
THU	30	Ethnic Day	27				29	Bakrid	27	
FRI	31		28				30		28	
SAT			29						29	
SUN			30						30	
MON									31	

(Handwritten Signature)
HOD

Moh Dept of Computer Science & Engineering
CITY ENGINEERING COLLEGE
Doddakallasandra Off Kanakapura Road
Bangalore 560061

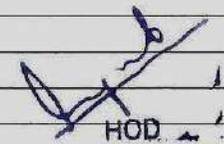


CITY ENGINEERING COLLEGE

Department of CSE

COE- 2022-23 Even SEM

	May 2023		June 2023		July 2023		Aug 2023		Sept 2023	
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON	1									
TUE	2						1			
WED	3						2			
THU	4		1				3			
FRI	5		2				4		1	Start of II sem Practical
SAT	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday	5	1st Saturday holiday	2	1st Saturday holiday
SUN	7		4		2		6		3	
MON	8		5	4th sem start 8th sem Practical	3		7		4	
TUE	9	Project Exhibition	6	Orientation for 4 th Sem	4		8		5	
WED	10		7		5		9		6	
THU	11		8		6	4 th Sem - I CIE	10		7	
FRI	12		9		7		11		8	
SAT	13		10		8		12	Guest Lecture for 4 th Sem	9	II sem last working day
SUN	14		11		9		13		10	
MON	15	IOT Lab Demo	12		10	VI SEM LAST WORKING day	14		11	Start of II sem Practical Exam
TUE	16	IOT LAB Demo 8th sem theory exam	13		11	6 TH sem practical exam	15	Independence day	12	4 th Sem – III CIE
WED	17	IV sem Internship	14		12		16	4 th Sem – II CIE	13	
THU	18	8th sem theory exam	15		13		17		14	
FRI	19		16		14		18	15	IV sem last working day	
SAT	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday	19	3rd Saturday holiday	16	3rd Saturday holiday
SUN	21		18		16		20		17	
MON	22		19		17		21		18	Ganesha festival
TUE	23		20		18		22		19	Start of IV sem Practical
WED	24		21		19		23		20	
THU	25	II SEM START	22		20		24		21	Start of II sem Theory exam
FRI	26		23		21		25		22	
SAT	27		24		22	4 th Sem - PTM	26		23	
SUN	28		25		23		27		24	
MON	29		26		24	6TH sem Theory exam	28		25	
TUE	30		27		25		29		26	
WED	31		28		26		30		27	
THU			29	Bakrid	27		31		28	Id Milad
FRI			30		28					
SAT					29	Moharam				
SUN					30					
MON					31				31	
									3/10	Start of IV sem Theory


 HOD
 Dept of Computer Science & Engineering
CITY ENGINEERING COLLEGE
 Soddakallasandra Off Kanakapura Road
 Bangalore 560061



ACADEMIC YEAR: 2022-23 (Even)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

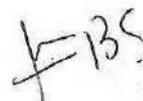
COURSE PREFERENCE

Name of the Faculty: Mrs. Shruthi B S

Designation: Asst Professor

Year / Semester:

Sl.No	Course Code and Name	Year/Semester
1.	BPOPS203- principles of programming using c	1 st / 2 nd 3 rd / 6 th
2.	18CSMP68- mobile application development	2 nd
3.	21CSA2- design and analysis of algorithms	2 nd / 4 th


Signature of faculty



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR : 2022-23 (Even)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PREFERENCE

Name of the Faculty: Mrs. Sangeetha Rao S

Designation: Asst Professor

Year / Semester:

Sl.No	Course Code and Name	Year/Semester
1.	18CSMP68 - mobile application	3rd / 6th
2.	18CSS84 - Technical seminar	4th / 8th
3.	21CS42 - Design and analysis of algorithms	2nd / 4th

Signature of faculty



ACADEMIC YEAR: 2022-23 EVEN

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr. Sowmya Naik P. T.	BETCK205H- Introduction to IoT	1 st / 2 nd	
2	Dr. Y. S. Kumaraswamy	18CS642-Object Oriented Modelling and Design	3 rd / 6 th	
3	Mrs. Ambika P. R.	1CSP83-Project Phase II 21CS42-Operating Systems	4 th /8 th 3 rd / 6 th	
4	Mrs. Archana Bhat	21CS42-Operating Systems 21CSL46-Python Programming Lab	2 nd / 4 th	
5	Mr. G. A. Girish	18CSS84-Technical Seminar 18SI85-Internship 18CSL66- SS Lab 21CS482-Unix Shell Programming	4 th /8 th 3 rd / 6 th 2 nd / 4 th	
6	Mrs Shashikala H C	18CS63- Web Technology and its applications 18CSMP68-Mobile Application Development	3 rd / 6 th	H.C
7	Mrs. Laxmi M. C.	21CS42-Operating Systems 21CSL46-Python Programming Lab	2 nd / 4 th	
8	Mr. Rakesh M	21CS42- Design and Analysis of Algorithms	2 nd / 4 th	
9	Mrs. Deepika	21CSL46-Python Programming Lab	2 nd / 4 th	



10	Mr. Gangappa B Demannavar	DAA Lab	2 nd /4 th	
11	Mrs. Tejaswini B N	18CS61-System Softwares and compilers 18CSL66- SS Lab	3 rd /6 th 3 rd /6 th	
12	Mrs.SangeetaS Uranakar	21CS42- Design and Analysis of Algorithms	2 nd /4 th	
13	Mr. Channabasappa	18CSL67-CG Lab	3 rd /6 th	
14	Mrs Jamuna B S	18CSL66- SS Lab	3 rd /6 th	
15	Mr. Vinodh Kumar S	18CSS84-Technical Seminar	4 th /8 th	
16	Mr. B. Ramesh	BPLCK205B- Introduction to Python Programming	1 st /2 nd	
17	Mrs. Shruthi B.S.	BPOPS203- Principles of Programming Using C	1 st /2 nd	
18	Mrs. Sangeetha Rao S	18CSMP68-Mobile Application Development	3 rd /6 th	
19	Mrs. Shwetha A	18CS62-Computer Graphics and Visualization 18CSL67-CG Lab	3 rd /6 th 3 rd /6 th	
20	Mrs. Tara V K	18CS81- Internet of things 11SI85-Internsip 18CSL67-CG Lab	4 th /8 th 3 rd /6 th	
21	Ms. Shruthi Vijay	18CSMP68-Mobile Application Development 21CSL46-Python Programming Lab	3 rd /6 th 2 nd /4 th	
22	Mrs. Hina Nazneen	21CS42- Design and Analysis of Algorithms	2 nd /4 th	
23	Mrs. Vibhavi R N	21CS42-Operating Systems 21CSL46-Python Programming Lab	2 nd /4 th	

HOD



CITY ENGINEERING COLLEGE

Department Of CSE

2023

Time Table for IV Sem A Section

Room No: 2301

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15 – 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM		
MON	MATHS	OS	Short Break	DAA	BIO	Lunch Break	DAA(A1) / MES(A2) / PYTHON(A3) LAB				
TUE	MES	UNIX		DAA(A2) / MES(A3) / PYTHON(A1) LAB			MATHS				
WED	DAA	MES		MATHS	OS		DAA(A3) / MES(A1) / PYTHON(A2) LAB				
THU	OS	BIO		MES	UHV		PHYSICAL EDUCATION				
FRI	CIP	MATHS		OS	DAA						
SAT	Internship Presentation				Internship Presentation			REMEDIAL CLASSES			

Sl. No	Course Code	Course Name	Course	Faculty Name
1	21CS41	Mathematical foundations for computing	MATHS	Mrs. Anitha
2	21CS42	Design and Analysis of Algorithm	DAA	Mrs. Sangeetha U
3	21CS43	Microcontroller and Embedded Systems	MES	Mrs. Madhavi K
4	21CS44	Operating Systems	OS	Mrs. Laxmi M C
5	21BE45	Biology for engineers	BIO	Ms. Meghana
6	21CSL46	Python programming laboratory	PYTHON	Mrs. Laxmi M C / Ms. Archana Bhat
7	21CIP47	Constitution of India and professional ethics	CIP	Ms. Meghana
8	21CS482	Ability enhancement course (Unix Shell Programming)	UNIX	Mr. Girish G A
9	21UH49	Universal Human Values	UHV	Mr. Nandish A C
10		DAA LAB		Mrs. Sangeetha U / Mrs. Hina / Mr. Rakesh M
11		MES LAB		MRs. Madhavi K / Mrs. Vani / Mrs. Punitha P
12	21PE83	Physical Education	PE	Mr. Rangaswamy

Class Teacher: Mr. Nandish A C

(Signature)
HOD

(Signature)
PRINCIPAL



CITY ENGINEERING COLLEGE

Department Of CSE

2023

Room No: C302

Time Table for IV Sem B Section

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM	
MON	DAA	MES	Short Break	MATHS	OS	Lunch Break	UHV			
TUE	OS	MES		BIO	UNIX		DAA(B1) / MES(B2) / PYTHON(B3) LAB			
WED	MES	MATHS		OS	DAA		PHYSICAL EDUCATION			
THU	BIO	DAA		DAA(B2) / MES(B3) / PYTHON(B1) LAB			MATHS	CIP		
FRI	MATHS	OS		DAA(B3) / MES(B1) / PYTHON(B2) LAB						
SAT	Internship Presentation			Internship Presentation			REMEDIAL CLASSES			

Sl. No	Course Code	Course Name	Course	Faculty Name
1	21CS41	Mathematical foundations for computing	MATHS	Mrs. Rekha
2	21CS42	Design and Analysis of Algorithm	DAA	Mrs. Hina Nazneen
3	21CS43	Microcontroller and Embedded Systems	MES	Mr. Gopikishan
4	21CS44	Operating Systems	OS	Mrs. Vibhavi R N
5	21BE45	Biology for engineers	BIO	Ms. Meghana
6	21CSL46	Python programming laboratory	PYTHON	Mrs. Shuthi V/ Mrs. Deepika/ Mrs. Vibhavi
7	21CIP47	Constitution of India and professional ethics	CIP	Ms. Meghana
8	21CS482	Ability enhancement course (Unix Shell Programming)	UNIX	Mr. Girish G A
9	21UH49	Universal Human Values	UHV	Mr. Nandish A C
10		DAA LAB		Mr. Sakthivel/ Mr. Gangappa / Mr. Nandish A.C
11		MES LAB		Mr. Gopikishan/ Mr. Vishwakiran/ Mrs. Punitha P
12	21PE83	Physical Education	PE	Mr. Rangaswamy

Class Teacher: Mr. Girish G. A

[Signature]
HOD

[Signature]
PRINCIPAL



CITY ENGINEERING COLLEGE

Department Of CSE

2023

Time Table for IV Sem C Section

Room No: C 303

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM	
MON	DAA	UHV	Short Break	DAA(C1) / MES(C2) / PYTHON(C3) LAB		Lunch Break	MATHS	UNIX		
TUE	MATHS	OS		MES	CIP		DAA			
WED	OS	BIO		DAA(C2) / MES(C3) / PYTHON(C1) LAB						
THU	MES	DAA		MATHS	OS		DAA(C3) / MES(C1) / PYTHON(C2) LAB			
FRI	BIO	MES		OS	MATHS		PHYSICAL EDUCATION			
SAT	MATDIP			Internship Presentation			REMEDIAL CLASSES			

Sl. No	Course Code	Course Name	Course	Faculty Name
1	21CS41	Mathematical foundations for computing	MATHS	Mrs. Vanitha
2	21CS42	Design and Analysis of Algorithm	DAA	Mr. Rakesh M
3	21CS43	Microcontroller and Embedded Systems	MES	Mr. Vishwakiran
4	21CS44	Operating Systems	OS	Mrs. Archana Bhat
5	21BE45	Biology for engineers	BIO	Ms. Meghana
6	21CSL46	Python programming laboratory	PYTHON	Mrs. Archana/ Mrs. Laxmi/ Mrs. Deepika
7	21CIP47	Constitution of India and professional ethics	CIP	Ms. Meghana
8	21CS482	Ability enhancement course (Unix Shell Programming)	UNIX	Mr. Girish G A
9	21UH49	Universal Human Values	UHV	Mr. Nandish A C
10	21MATDIP41	Additional Math's-I	MATDIP	Mrs. Rekha/ Mrs. Vaniha
11		DAA LAB		Mrs. Sangeetha U/ Mr. Rakesh/ Mr. Gangappa
12		MES LAB		Mr. Gopikishan/ Mr. VishwaKiran/ Mrs. Punitha P
13	21PE83	Physical Education	PE	Mr. Rangaswamy

Class Teacher: Mrs. Sangeetha U

HOD

PRINCIPAL



CITY ENGINEERING COLLEGE

Department Of CSE

MARCH 2023

Time Table for VI Sem A Section

Room: C-203

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	CG	WEB	SHORT BREAK	MAD(T)	MAD(T)	LUNCH	SS/CG(T)+A1-CG LAB /A2-SSC LAB		
TUE	SS	OE		WEB	OOMD		WEB(T)		
WED	OE	CG		SS	WEB		SS/CG(T)+A1- SSC LAB/ A2- CG LAB		
THU	WEB(T)	OOMD		CG(T)	SS(T)		A1- MAD LAB		
FRI	OE	SS		OOMD	CG		A2-MAD LAB		
SAT	CG(T)	CG(T)		SS(T)	SS(T)		REMEDIAL CLASSES		

Sl. No	Course Code	Course Name	Course	Faculty Name
1	18CS61	SYSTEM SOFTWARE AND COMPILERS	SSC	Prof.Tejaswini B N
2	18CS62	COMPUTER GRAPHICS AND VISUALIZATION	CG	Prof.Swetha. A
3	18CS63	WEB TECHNOLOGIES AND ITS APPLICATIONS	WEB	Prof.Shashikala H C
4	18CS642	OBJECT ORIENTED MODELLING AND DESIGN	OOMD	Dr. Y.S KumaraSwamy
5	18ME651	NON-CONVENTIONAL ENERGY SOURCES	OE	Prof.Harshavardhan
6	18CSL66	SYSTEM SOFTWARE LABORATORY	SS LAB	Prof.Tejaswini B N /Mr. Girish G A/ Mrs. Jamuna B S
7	18CSL67	COMPUTER GRAPHICS LAB WITH MINI PROJECT	CG LAB	Prof.Swetha. A/ Prof. Tara V K/ Mr. Channabasappa
8	18CSMP68	MOBILE APP DEVELOPMENT	MAD LAB	Prof. Shruthi Vijay/ Prof.Shashikala H C/ Mrs. Sangeetha Rao

Class Teacher: Prof. Shashikala H C

Shashikala H.C.

[Signature]
HOD

[Signature]
Principal



CITY ENGINEERING COLLEGE

Department Of CSE

MARCH 2023

Time Table for VI Sem B Section

Room: C-204

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	OE	SS	SHORT BREAK	CG	WEB		B1 – MAD LAB		
TUE	WEB	OOMD		SS	CG		SS/CG(T)+B1-SSC LAB/ B2 CG LAB		
WED	WEB	OE		MAD(T)	MAD(T)		B2- MAD LAB		
THU	CG(T)	OE		WEB	OOMD		SS/CG(T)+B1 -CG LAB/B2- SSC LAB		
FRI	OOMD	CG		WEB(T)	SS		SS		
SAT	SS(T)	SS(T)		CG(T)	CG(T)		REMEDIAL CLASSES		

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS61	SYSTEM SOFTWARE AND COMPILERS	SSC	Prof.Tejaswini B N
2	18CS62	COMPUTER GRAPHICS AND VISUALIZATION	CG	Prof.Swetha. A
3	18CS63	WEB TECHNOLOGIES AND ITS APPLICATIONS	WEB	Prof.Shashikala H C
4	18CS642	OBJECT ORIENTED MODELLING AND DESIGN	OOMD	Dr. Y.S KumaraSwamy
5	18ME651	NON-CONVENTIONAL ENERGY SOURCES	OE	Prof.Harshavardhan
6	18CSL66	SYSTEM SOFTWARE LABORATORY	SS LAB	Prof.Tejaswini B N / Mr. Girish G A/ Mrs. Jamuna B S
7	18CSL67	COMPUTER GRAPHICS LAB WITH MINI PROJECT	CG LAB	Prof.Swetha. A/ Prof. Tara V K/ Mr. Channabasappa
8	18CSMP68	MOBILE APP DEVELOPMENT	MAD LAB	Prof. Shruthi Vijay/ Prof.Shashikala H C/ Mrs. Sangeetha Rao

Swetha A

Class Teacher: Prof. Swetha A

[Signature]
HOD

[Signature]
Principal



CITY ENGINEERING COLLEGE

Department Of CSE

Feb- June 2023

Time Table for VIII Sem A Section

Room: C-201

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15– 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	IOT	SAN	Short Break	IOT	Project Work Phase2	Lunch Break	Project Work Phase 2		
TUE	SAN	IOT		SAN	Technical Seminar		Technical Seminar		
WED	Project/ Seminar/Internship			Project/ Seminar/Internship			Internship		
THU	Project/ Seminar/Internship			Project/ Seminar/Internship			Project/ Seminar/Internship		
FRI	Project/ Seminar/Internship			Project/ Seminar/Internship			Project/ Seminar/Internship		
SAT	AICTE Activity			AICTE Activity					

SL. NO	COURSE CODE	COURSE NAME	COURSE	FACULTY NAME
1	18CS81	INTERNET OF THINGS	IOT	PROF. TARA V. K
2	18CS822	STORAGE AREA NETWORK	SAN	PROF. NANDISH A.C
3	18CSP83	PROJECT WORK PHASE 2	PROJECT	PROF. NANDISH A.C / PROF.AMBIKA P.R
4	18CSS84	TECHNICAL SEMINAR	SEMINAR	PROF. VINODH KUMAR S/ PROF. GIRISH G.A
5	18CSI85	INTERNSHIP	INT	PROF. GIRISH G A/ PROF. TARA V K

Class Teacher: Prof. Nandish A.C

HOD

Principal



CITY ENGINEERING COLLEGE

Department Of CSE

Feb- June 2023

Time Table for VIII Sem B Section

Room: C-202

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15– 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	SAN	IOT	Short Break	SAN	Project Work Phase2	Lunch Break	Project Work Phase 2		
TUE	IOT	SAN		IOT	Technical Seminar		Technical Seminar		
WED	Project/ Seminar/Internship			Project/ Seminar/Internship			Internship		
THU	Project/ Seminar/Internship			Project/ Seminar/Internship			Project/ Seminar/Internship		
FRI	Project/ Seminar/Internship			Project/ Seminar/Internship			Project/ Seminar/Internship		
SAT	AICTE Activity			AICTE Activity					

SL. NO	COURSE CODE	COURSE NAME	COURSE	FACULTY NAME
1	18CS81	INTERNET OF THINGS	IOT	PROF. TARA V. K
2	18CS822	STORAGE AREA NETWORK	SAN	PROF. NANDISH A.C
3	18CSP83	PROJECT WORK PHASE 2	PROJECT	PROF. NANDISH A.C / PROF.AMBIKA P.R
4	18CSS84	TECHNICAL SEMINAR	SEMINAR	PROF. VINODH KUMAR S/ PROF. GIRISH G.A
5	18CSI85	INTERNSHIP	INT	PROF. GIRISH G A/ PROF. TARA V K

Tara V.K
Class Teacher: Prof. Tara V.K

[Signature]
HOD

[Signature]
Principal



CITY ENGINEERING COLLEGE

Department Of CSE

June – Sep 2023

Faculty Name: Mrs. Laxmi M C

Subject: Operating Systems (21CS44)

DAY	9:00 – 10:00	10:00 – 11:00	11:00-11:15	11:15-12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00- 4:00	4:00-5:00
MON		IV - A		Python Lab (C3)			Python Lab (A3)		
TUE				Python Lab (A1)					
WED				Python Lab (C1)	IV - A		Python Lab (A2)		
THU		IV - A					Python Lab (C2)		
FRI				IV - A					
SAT									

HOD

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
B.E. in Computer Science and Engineering
Scheme of Teaching and Examinations 2021
Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2021 - 22)

IV SEMESTER

Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination			Credits	
				Theory Lecture	Tutorial	Practical/ Drawing	Self -Study	Duration in hours	CIE Marks	SEE Marks		Total Marks
				L	T	P	S					
1	BSC 21CS41	Mathematical Foundations for Computing	Maths	2	2	0		03	50	50	100	3
2	IPCC 21CS42	Design and Analysis of Algorithms	Any CS Board Department	3	0	2		03	50	50	100	4
3	IPCC 21CS43	Microcontroller and Embedded Systems		3	0	2		03	50	50	100	4
4	PCC 21CS44	Operating Systems		2	2	0		03	50	50	100	3
5	AEC 21BE45	Biology For Engineers	BT, CHE, PHY	2	0	0		02	50	50	100	2
6	PCC 21CSL46	Python Programming Laboratory	Any CS Board Department	0	0	2		03	50	50	100	1
7	HSMC 21KSK37/47	Sanskrutika Kannada	HSMC	1	0	0		01	50	50	100	1
	HSMC 21KKB37/47	Balake Kannada										
	OR											
	HSMC 21CIP37/47	Constitution of India & Professional Ethics										
8	AEC 21CS48X/21C SL48X	Ability Enhancement Course- IV	TD and PSB: Concerned department	If offered as theory Course				01	50	50	100	1
				1	0	0						
				If offered as lab. course				02				
				0	0	2						
9	UHV 21UH49	Universal Human Values	Any Department	1	0	0		01	50	50	100	1
10	INT 21INT49	Inter/Intra Institutional Internship	Evaluation By the appropriate authorities	Completed during the intervening period of II and III semesters by students admitted to first year of BE./B.Tech and during the intervening period of III and IV semesters by Lateral entry students admitted to III semester.				3	100	--	100	2
Total									550	450	1000	22

Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs

1	NCMC 21MATDIP41	Additional Mathematics - II	Maths	02	02	--	--	--	100	--	100	0
---	--------------------	-----------------------------	-------	----	----	----	----	----	-----	----	-----	---

Note: BSC: Basic Science Course, IPCC: Integrated Professional Core Course, PCC: Professional Core Course, AEC –Ability Enhancement Courses, HSMC: Humanity and Social Science and Management Courses, UHV- Universal Human Value Courses.

L –Lecture, T – Tutorial, P- Practical/ Drawing, S – Self Study Component, CIE: Continuous Internal Evaluation, SEE: Semester End Examination.

21KSK37/47 Sanskrutika Kannada is for students who speak, read and write Kannada and 21KKB37/47 Balake Kannada is for non-Kannada speaking, reading, and writing students.

Integrated Professional Core Course (IPCC): Refers to Professional Theory Core Course Integrated with Practical's of the same course. Credit for IPCC can be 04 and its Teaching – Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from practical part of IPCC shall be included in the SEE question paper. For more details the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech.) 2021-22 may be referred.

IV Semester

OPERATING SYSTEMS			
Course Code:	21CS44	CIE Marks	50
Teaching Hours/Week (L:T:P:S)	2:020:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Course Objectives:			
<p>CLO 1. Demonstrate the need for OS and different types of OS</p> <p>CLO 2. Apply suitable techniques for management of different resources</p> <p>CLO 3. Use processor, memory, storage and file system commands</p> <p>CLO 4. Realize the different concepts of OS in platform of usage through case studies</p>			
Teaching-Learning Process (General Instructions)			
<p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> Lecturer methods (L) need not to be only traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes. Use of Video/Animation to explain functioning of various concepts. Encourage collaborative (Group Learning) Learning in the class. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it. Introduce Topics in manifold representations. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding. 			
Module-1			
<p>Introduction to operating systems, System structures: What operating systems do; Computer System organization; Computer System architecture; Operating System structure; Operating System operations; Process management; Memory management; Storage management; Protection and Security; Distributed system; Special-purpose systems; Computing environments.</p> <p>Operating System Services: User - Operating System interface; System calls; Types of system calls; System programs; Operating system design and implementation; Operating System structure; Virtual machines; Operating System generation; System boot.</p> <p>Process Management: Process concept; Process scheduling; Operations on processes; Inter process communication</p>			
Textbook 1: Chapter - 1,2,3			
Teaching-Learning Process	<p>Active learning and problem solving</p> <ol style="list-style-type: none"> https://www.youtube.com/watch?v=vBURTt97EkA&list=PLBlNk6fEvqRiVhbXDGLXdk_OQAeuVcp2Q https://www.youtube.com/watch?v=a2B69vCtjOU&list=PL3-wYxht4vCjpcfUDz-TgD_ainZ2K3MUZ&index=2 		
Module-2			

Multi-threaded Programming: Overview; Multithreading models; Thread Libraries; Threading issues. Process Scheduling: Basic concepts; Scheduling Criteria; Scheduling Algorithms; Multiple-processor scheduling; Thread scheduling.

Process Synchronization: Synchronization: The critical section problem; Peterson's solution; Synchronization hardware; Semaphores; Classical problems of synchronization; Monitors.

Textbook 1: Chapter - 4,5

Teaching-Learning Process	Active Learning and problem solving 1. https://www.youtube.com/watch?v=HW2Wcx-ktsc 2. https://www.youtube.com/watch?v=9YRxhltv9Zo
----------------------------------	---

Module-3

Deadlocks: Deadlocks; System model; Deadlock characterization; Methods for handling deadlocks; Deadlock prevention; Deadlock avoidance; Deadlock detection and recovery from deadlock.

Memory Management: Memory management strategies: Background; Swapping; Contiguous memory allocation; Paging; Structure of page table; Segmentation.

Textbook 1: Chapter - 7,8

Teaching-Learning Process	Active Learning, Problem solving based on deadlock with animation 1. https://www.youtube.com/watch?v=MYgmmJlfdBg 2. https://www.youtube.com/watch?v=Y14b7_T3AEw&list=PLEJxKK7AcSEGPOCFtQTJhOEIU44J_JAun&index=30
----------------------------------	---

Module-4

Virtual Memory Management: Background; Demand paging; Copy-on-write; Page replacement; Allocation of frames; Thrashing.

File System, Implementation of File System: File system: File concept; Access methods; Directory structure; File system mounting; File sharing; Protection: Implementing File system: File system structure; File system implementation; Directory implementation; Allocation methods; Free space management.

Textbook 1: Chapter - 9,10,11

Teaching-Learning Process	Active learning about memory management and File system 1. https://www.youtube.com/watch?v=pl6qrCB8pDw&list=PLIY8eNdw5tW-BxRY0yK3fYTYVqytw8qhp 2. https://www.youtube.com/watch?v=-orfFhvNBzY
----------------------------------	---

Module-5

Secondary Storage Structures, Protection: Mass storage structures; Disk structure; Disk attachment; Disk scheduling; Disk management; Swap space management. Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix, Implementation of access matrix, Access control, Revocation of access rights, Capability- Based systems.

Case Study: The Linux Operating System: Linux history; Design principles; Kernel modules; Process management; Scheduling; Memory Management; File systems, Input and output; Inter-process communication.

Textbook 1: Chapter - 2,21

Teaching-Learning Process	Active learning about case studies 1. https://www.youtube.com/watch?v=TTBkc5eiju4 2. https://www.youtube.com/watch?v=8hkvMRGTzCM&list=PLEAYkSg4uSQ2PAch478muxnoeTNz_QeUI&index=36 3. https://www.youtube.com/watch?v=mX1FEur4VCw
----------------------------------	--

Course Outcomes (Course Skill Set)

At the end of the course the student will be able to:

- CO 1. Identify the structure of an operating system and its scheduling mechanism.
- CO 2. Demonstrate the allocation of resources for a process using scheduling algorithm.
- CO 3. Identify root causes of deadlock and provide the solution for deadlock elimination.
- CO 4. Explore about the storage structures and learn about the Linux Operating system.
- CO 5. Analyze Storage Structures and Implement Customized Case study

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation:

Three Unit Tests each of 20 Marks (duration 01 hour)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of 10 Marks

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for 20 Marks (duration 01 hours)

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be scaled down to 50 marks

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods /question paper has to be designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (duration 03 hours)

1. The question paper will have ten questions. Each question is set for 20 marks. Marks scored shall be proportionally reduced to 50 marks
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.

The students have to answer 5 full questions, selecting one full question from each module

Suggested Learning Resources:

Textbooks

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Principles 7th edition, Wiley-India, 2006

Reference Books

1. Ann McHoes Ida M Fylnn, Understanding Operating System, Cengage Learning, 6th Edition
2. D.M Dhamdhare, Operating Systems: A Concept Based Approach 3rd Ed, McGraw- Hill, 2013.
3. P.C.P. Bhatt, An Introduction to Operating Systems: Concepts and Practice 4th Edition, PHI(EEE), 2014.
4. William Stallings Operating Systems: Internals and Design Principles, 6th Edition, Pearson.

Weblinks and Video Lectures (e-Resources):

1. https://www.youtube.com/watch?v=vBURTt97EkA&list=PLBlNk6fEyqRiVhbXDGLXDk_OQAe_uVcp2Q
2. https://www.youtube.com/watch?v=783KAB-tuE4&list=PLIemF3uozcAKTgsCij82voMK3TMR0YE_f
3. <https://www.youtube.com/watch?v=3-ITLMMeeXY&list=PL3pGy4HtqwD0n7bQfHjPnsWzkeR-n6mkQ>

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Real world problem solving using group discussion.
- Role play for process scheduling.
- Present animation for Deadlock.
- Real world examples of memory management concepts

Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN

--	--	--	--	--	--	--	--	--	--

Fourth Semester B.E. Degree Examination Operating Systems

TIME: 03 Hours

Max. Marks: 100

Note: Answer any FIVE full questions, choosing at least ONE question from each MODULE.

Module -1				Bloom's Taxonomy Level	Marks	
Q.01	a	Explain the dual mode operation of operating system.		L2	7	
	b	What is operating system? Explain multiprogramming and time sharing systems.		L2	8	
	c	Explain the types of multiprocessing and types of clustering.		L2	5	
OR						
Q.02	a	Describe the implementation of interprocess communication using shared memory and message passing approaches.		L2	8	
	b	Explain the process states with a neat diagram.		L2	6	
	c	With a neat diagram explain the concept of virtual machines.		L2	6	
Module-2						
Q. 03	a	Explain the multithreading models with diagrams.		L2	6	
	b	Discuss the threading issues with multithreaded models.		L1	6	
	c	For below processes compute the average waiting time using RR(q=2), FCFS, SJF scheduling algorithms		L3	8	
		Process	Arrival Time	Burst Time		
		p1	0	9		
		p2	0	5		
		p3	2	6		
		p4	3	7		
OR						
Q.04	a	Illustrate how Reader's-Writer's problem can be solved by using semaphores.		L4	8	
	b	What are Monitors? Explain dining Philosopher's solution using monitor.		L2	6	
	c	Illustrate Peterson's solution for critical section problem.		L4	6	
Module-3						
Q. 05	a	Determine whether the following system is safe using Banker's algorithm. If the request for p1 arrives for (1 0 2) can the request be granted immediately.		L3	10	
			Process	Allocation a b c	Maximum a b c	Available a b c
			p0	0 1 0	7 5 3	3 3 2
		p1	2 0 0	3 2 2		
		p2	3 0 2	9 0 2		
		p3	2 1 1	2 2 2		
		p4	0 0 0	4 3 3		
	b	What is deadlock? What are necessary conditions for deadlock?		L1	5	
	c	What is resource Allocation Graph? Explain how it is very useful in describing deadly embrace by considering an example.		L2	5	
OR						
Q. 06	a	Discuss the various approaches used for deadlock recovery.		L2	6	
	b	Illustrate with example, the internal and external fragmentation problem		L4	6	

		encountered in continuous memory allocation.		
	c	Explain the structure of page table.	L2	8
Module-4				
Q. 07	a	Illustrate how demand paging affects systems performance.	L4	8
	b	Describe the steps in handling a page fault.	L2	8
	c	What is thrashing? How it can be controlled?	L1	4
OR				
Q. 08	a	Explain briefly the various operations performed on files.	L2	8
	b	Explain the various access methods of files.	L2	6
	c	Explain the various methods in implementing file systems.	L2	6
Module-5				
Q. 09	a	With a neat diagram explain in detail the components of a Linux Operating System.	L2	8
	b	Explain different IPC mechanisms available in Linux.	L2	6
	c	Explain process scheduling in a Linux system.	L2	6
OR				
Q. 10	a	Describe on different Linux kernel modules.	L2	8
	b	Explain the various disk scheduling algorithms with example.	L2	8
	c	Write a short note on portability issues in Linux.	L1	4

City Engineering College
Department of CSE/ ISE/ AI ML

QUESTION BANK

SUBJECT: OPERATING SYSTEM
SEMESTER: IV

SECTIONS: A, B, C, D
SUB CODE: 21CS44

MODULE 1

Q.no	Questions
1.	Define an operating system.Explain two view points of OS role.Also explain abstract view of the components of a computer system?
2.a.	What are OS operation?Explain.
b.	Give a note on Distributed Systems?
3.	Discuss the operating system functions or services.
4.	What are the major activities of OS with regards to process and memory managment?
5.	What are system calls?Explain different types of system calls?
6.	Expalin the types of multiprocessor systems and the types of clustering.
7.	Explain different categories of system programs.
8.	Differentiate between multiprogramming and multi tasking systems.
9.	Expain the advantages of layered approach with a neat diagram.
10.	What are virtual machines?Explain its advantages with a neat diagram.
11.	Explain the just-in-time(JIT) compiler,used in java virtual machine.
12.	With a diagram of VM-WARE architecture,Explain the concept of virtual machine(VM) and main advantages of using VM architecture.
13.	What is process?With a state diagram,explain states of a process.
14.a.	Write a not on context switch.
b.	What is PCB?Enumerate and explain various fields in PCB.
15.	Explain direct and indirect communication with respect to message passing systems.
16.	Explain the difference between long term and short term and medium term schedulers .
17.	Describe implementation of IPC using shared memory and message passing.

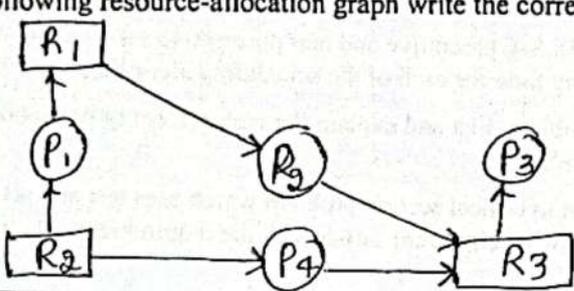


MODULE 2

Q.no	Questions																								
1.	What are the differences between user level and kernel level threads?																								
2.	Discuss common ways of establishing relationship between user and kernel thread.																								
3.	Differentiate between 1.process and thread 2.short term and medium term sheduler 3.user level and kernel level threads 4.waiting and turnaround time																								
4.	Define the five scheduling criteria considered in Process scheduling																								
5.	Discuss any 4 treading isuses that come with multithreaded programs.																								
6.	<p>Consider the following set of processes.Assume the length of the CPU burst time is given in milliseconds</p> <table border="1"> <thead> <tr> <th>Process</th> <th>Arrival time</th> <th>Burst time</th> <th>priority</th> </tr> </thead> <tbody> <tr> <td>p1</td> <td>0</td> <td>10</td> <td>3</td> </tr> <tr> <td>p2</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>p3</td> <td>3</td> <td>2</td> <td>3</td> </tr> <tr> <td>p4</td> <td>5</td> <td>1</td> <td>4</td> </tr> <tr> <td>p5</td> <td>10</td> <td>5</td> <td>2</td> </tr> </tbody> </table> <p>Draw gantt charts illustrating the execution of these processes using FCFS and pre-emptive priority scheduling algorithm.assume highest priority=1 and lowest priority=4.also calculate average waiting time and average turn around time of both the algorithms.</p>	Process	Arrival time	Burst time	priority	p1	0	10	3	p2	0	1	1	p3	3	2	3	p4	5	1	4	p5	10	5	2
Process	Arrival time	Burst time	priority																						
p1	0	10	3																						
p2	0	1	1																						
p3	3	2	3																						
p4	5	1	4																						
p5	10	5	2																						
7.	<p>Following is the snapshot of a cpu</p> <table border="1"> <thead> <tr> <th>process</th> <th>CPU burst</th> <th>Arrival time</th> </tr> </thead> <tbody> <tr> <td>p1</td> <td>10</td> <td>0</td> </tr> <tr> <td>p2</td> <td>29</td> <td>1</td> </tr> <tr> <td>p3</td> <td>03</td> <td>2</td> </tr> <tr> <td>p4</td> <td>07</td> <td>3</td> </tr> </tbody> </table> <p>Draw gantt chart and calculate the waiting and turnaround time using FCFS,SJF nad RR with time quatum 10 scheduling algorithms</p>	process	CPU burst	Arrival time	p1	10	0	p2	29	1	p3	03	2	p4	07	3									
process	CPU burst	Arrival time																							
p1	10	0																							
p2	29	1																							
p3	03	2																							
p4	07	3																							
8.	<p>Consider the following set of processes with CPU burst time(in m sec)</p> <table border="1"> <thead> <tr> <th>process</th> <th>arrival</th> <th>Burst time</th> </tr> </thead> <tbody> <tr> <td>p0</td> <td>0</td> <td>6</td> </tr> <tr> <td>p1</td> <td>1</td> <td>3</td> </tr> <tr> <td>p2</td> <td>2</td> <td>1</td> </tr> <tr> <td>p3</td> <td>3</td> <td>4</td> </tr> </tbody> </table> <p>i)Draw gantt chart illustrating the executing of above processes using SRTF and non preemptive SJF ii)Find the turn around time for each processes for SRTF and SJF.hence show that SRTF is faster than SJF</p>	process	arrival	Burst time	p0	0	6	p1	1	3	p2	2	1	p3	3	4									
process	arrival	Burst time																							
p0	0	6																							
p1	1	3																							
p2	2	1																							
p3	3	4																							

Two

MODULE 3

Q.no	Questions																																																																																										
1.	What are deadlocks? Explain the necessary conditions for its occurrence.																																																																																										
2.a.	Dead lock exists if a cycle exists. Yes or no. Justify your answer with a suitable example.																																																																																										
b.	What is Resource Allocation Graph(RAG)? Explain how RAG is very useful in describing deadly embrace (dead lock)by considering your own example																																																																																										
3.	For the following resource-allocation graph write the corresponding wait-for graph. 																																																																																										
4.	Explain the process of recovery from deadlock.																																																																																										
5.	Using Banker's algorithm determine whether the system is in a safe state.																																																																																										
6.	Consider the following snapshot of a system: <table style="margin-left: 20px;"> <tr> <td></td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td></td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td></td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> </tr> <tr> <td>P₀</td> <td>0</td> <td>0</td> <td>1</td> <td>2</td> <td></td> <td>0</td> <td>0</td> <td>1</td> <td>2</td> <td></td> <td>1</td> <td>5</td> <td>2</td> <td>0</td> </tr> <tr> <td>P₁</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td>1</td> <td>7</td> <td>5</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₂</td> <td>1</td> <td>3</td> <td>5</td> <td>4</td> <td></td> <td>2</td> <td>3</td> <td>5</td> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₃</td> <td>0</td> <td>6</td> <td>3</td> <td>2</td> <td></td> <td>0</td> <td>6</td> <td>5</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₄</td> <td>0</td> <td>0</td> <td>1</td> <td>4</td> <td></td> <td>0</td> <td>6</td> <td>5</td> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Answer the following questions using the Banker's algorithm: i) What is the content of matrix need? ii) Is the system in a safe state? iii) If a request from process P1 arrives for(0,4,2,0) can the request be granted immediately?(10) iv) Is the system in a safe state?</p>		A	B	C	D		A	B	C	D		A	B	C	D	P ₀	0	0	1	2		0	0	1	2		1	5	2	0	P ₁	1	0	0	0		1	7	5	0						P ₂	1	3	5	4		2	3	5	6						P ₃	0	6	3	2		0	6	5	2						P ₄	0	0	1	4		0	6	5	6					
	A	B	C	D		A	B	C	D		A	B	C	D																																																																													
P ₀	0	0	1	2		0	0	1	2		1	5	2	0																																																																													
P ₁	1	0	0	0		1	7	5	0																																																																																		
P ₂	1	3	5	4		2	3	5	6																																																																																		
P ₃	0	6	3	2		0	6	5	2																																																																																		
P ₄	0	0	1	4		0	6	5	6																																																																																		
7.	System consists of five jobs (J1,J2,J3,J4,J5) and three resources (R1,R2,R3) . Resource type R1 has 10 instances, resource type R2 has 5 instances and R3 has 7 instances. The following snapshot of the system has been taken: <table style="margin-left: 20px;"> <tr> <td></td> <td>R₁</td> <td>R₂</td> <td>R₃</td> <td></td> <td>R₁</td> <td>R₂</td> <td>R₃</td> <td></td> <td>R₁</td> <td>R₂</td> <td>R₃</td> </tr> <tr> <td>J₁</td> <td>0</td> <td>1</td> <td>0</td> <td></td> <td>7</td> <td>5</td> <td>3</td> <td></td> <td>3</td> <td>3</td> <td>2</td> </tr> <tr> <td>J₂</td> <td>2</td> <td>0</td> <td>0</td> <td></td> <td>3</td> <td>2</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>J₃</td> <td>3</td> <td>0</td> <td>2</td> <td></td> <td>9</td> <td>0</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>J₄</td> <td>2</td> <td>1</td> <td>1</td> <td></td> <td>2</td> <td>2</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>J₅</td> <td>0</td> <td>0</td> <td>2</td> <td></td> <td>4</td> <td>3</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Find need matrix and calculate the safe sequence by using Banker's algorithm. Mention the above system is safe or not safe.</p>		R ₁	R ₂	R ₃		R ₁	R ₂	R ₃		R ₁	R ₂	R ₃	J ₁	0	1	0		7	5	3		3	3	2	J ₂	2	0	0		3	2	2					J ₃	3	0	2		9	0	2					J ₄	2	1	1		2	2	2					J ₅	0	0	2		4	3	3																						
	R ₁	R ₂	R ₃		R ₁	R ₂	R ₃		R ₁	R ₂	R ₃																																																																																
J ₁	0	1	0		7	5	3		3	3	2																																																																																
J ₂	2	0	0		3	2	2																																																																																				
J ₃	3	0	2		9	0	2																																																																																				
J ₄	2	1	1		2	2	2																																																																																				
J ₅	0	0	2		4	3	3																																																																																				
8.	Using Banker's algorithm determine whether the system is in a safe state. <table style="margin-left: 20px;"> <tr> <td></td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td></td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td></td> <td>A</td> <td>B</td> <td>C</td> </tr> <tr> <td>P₀</td> <td>0</td> <td>0</td> <td>2</td> <td></td> <td></td> <td>0</td> <td>0</td> <td>4</td> <td></td> <td></td> <td>1</td> <td>0</td> <td>2</td> </tr> <tr> <td>P₁</td> <td>1</td> <td>0</td> <td>0</td> <td></td> <td></td> <td>2</td> <td>0</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₂</td> <td>1</td> <td>3</td> <td>5</td> <td></td> <td></td> <td>1</td> <td>3</td> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₃</td> <td>6</td> <td>3</td> <td>2</td> <td></td> <td></td> <td>8</td> <td>4</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₄</td> <td>1</td> <td>4</td> <td>3</td> <td></td> <td></td> <td>1</td> <td>4</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>If a request from process P2 arrives for (0 0 2), can the request be granted immediately?</p>		A	B	C	D		A	B	C	D		A	B	C	P ₀	0	0	2			0	0	4			1	0	2	P ₁	1	0	0			2	0	1						P ₂	1	3	5			1	3	7						P ₃	6	3	2			8	4	2						P ₄	1	4	3			1	4	2											
	A	B	C	D		A	B	C	D		A	B	C																																																																														
P ₀	0	0	2			0	0	4			1	0	2																																																																														
P ₁	1	0	0			2	0	1																																																																																			
P ₂	1	3	5			1	3	7																																																																																			
P ₃	6	3	2			8	4	2																																																																																			
P ₄	1	4	3			1	4	2																																																																																			
9.	Consider the following snapshot of a system.																																																																																										

su

9. Consider the following set of processes with arrival time

process	Burst time	Arrival time
p1	10	0
p2	1	0
p3	2	1
p4	4	2
p5	3	2

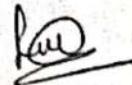
- i) Draw gantt charts using FCFS, SJF preemptive and non preemptive scheduling.
- ii) Calculate the average waiting time for each of the scheduling algorithm.

10.	Explain the critical section problem. List and explain the requirement to be met by a solution to critical section problem.
11.	Describe an n-process solution to critical section problem which uses test and set () hardware instruction. Prove how its algorithm satisfies all the requirements of critical section problems solution.
12.	Explain Peterson's solution to critical section problem
13.	What are semaphores? Explain any three use cases of semaphores
14.	What do you mean by a binary semaphore and a counting semaphore?
15.	What is race condition? Explain Reader's writer's problem with semaphores
16.	What is semaphore? Explain how it can be used to solve the producer-consumer problem
17.	What are monitors? Explain its usage and implementation.
18.	Explain the range of monitors with a schematic view of its structure; write a monitor solution to bounded- buffer problem.
19.	Describe the monitor solution to the classical dining philosopher's problem.
20.	What is busy waiting in a critical section concept? How semaphore is used to solve critical section problem? What are the advantages of semaphore?

Law

MODULE 4

Q.no	Questions
1.	What is thrashing? How does the system detect thrashing?
2.a.	Discuss on the performance of demand paging.
b.	
3.	. Short notes on: a. Page replacement algorithms b. Steps in handling page fault.
4.	What do you mean by a copy-on-write? Where is it used? Explain in brief.
5.	Consider the following page reference string 1,2,3,5,2,3,5,7,2,1,2,3,8,6,4,3,2,2,3,6. Assuming there are three memory frames, how many faults would occur in the case of i) LRU ii) Optimal algorithm. Note that initially all frames are empty.
6.	Consider the following sequence of memory references from a 460 word program. 10,11,104,170,73,309,185,245,246,434,458,364 i) Show the reference string assuming page size of 100 words ii) Find page fault rate for the above reference string assuming 200 words of primary memory available and FIFO and LRU replacement algorithms.
7.	Explain briefly the various operations performed on files.
8.	Explain the various access method of files.
9.	. Explain various allocation methods in implementing file systems.
10.	Explain different approaches to managing free space on disk storage.
11.	Describe the various directory structures
12.a.	With supporting diagrams distinguish between single-level and two-level directory structure.
b.	Compare contiguous and linked allocation methods for disk space.
c.	Explain bit vector free-space management technique
13.	Explain various file protection mechanisms.



	Answer the questions using Banker's algorithm. i) What is the content of the matrix need? ii) Is the system is safe state? iii) If a request P1 arrives for (1,0,2), can the request be granted immediately?
10.	For the following snapshot find the safe sequence using Banker's algorithm: The number of resource units are R1,R2,R3 which are 7,7,10 respectively.
11.	Distinguish between internal and external fragmentation.
12.	Explain with a diagram, how TLB is used to solve the problem of simple paging scheme.
13.	Discuss paging with an example.
15.a.	What is Belady's anomaly? Explain with an example.
b.	Distinguish between: i) Logical address space and physical address space. ii) Internal fragmentation and external fragmentation. iii) Paging and segmentation.
17.	With a supporting paging hardware, explain in detail concept of paging with an example for a 32-byte memory with 4-type pages with a process being 16-bytes. How many bits are reserved for page number and page offset in the logical address. Suppose the logical address is 5, calculate the corresponding physical address, after populating memory and page table.
18.	Given memory partitions of 100K,500K,200K,300K and 600K, apply first fit and best fit algorithm to place 212K,417 K,112 K and 426 K.
19.	Explain with the help of supporting hardware diagram how the TLB improves the performance of a demand paging system.
	What are the draw backs of contiguous memory allocation?
	What is swapping? Does this increase the operating systems overhead? Justify your answer.

Handwritten signature

MODULE 5

Q.no	Questions
1.	Explain the various Disk scheduling algorithms with example.
2.a.	Point out and explain briefly the problems with RAID
b.	Explain Access Matrix method of system protection.
3.	What is disk scheduling? Explain the following with diagram: i) FCFS ii) SSTF iii) SCAN.
4.	What is an access matrix? Explain the following operations in access matrix with an example for each: i) Copy ii) Transfer iii) Limited copy
5.	Suppose the position of cylinder is at 53. The disk drive has cylinders numbered from 0-199. The queue of pending requests in FIFO order is: 98,183,37,122,14,124,65,67. Starting from the current head position, what is the total distance traveled (in cylinders) by the disk arm to satisfy the requests using algorithms FCFS, SSTF, SCAN and LOOK. Illustrate with figures in each case.
6.	Describe the access matrix model used for protection purpose.
7.a.	What are boot block and bad blocks? Explain.
b.	Explain the goals and principles of protection.
8.	Explain the difference between protection and security? Describe the scheme of capability lists to implement protection
9.	Write short notes on: i) Swap space management ii) Revocation of access rights.
10.	A drive has 5000 cylinders numbered 0 to 4999. The drive is currently serving a request at 143 and previously serviced a request at 125. The queue of pending requests in FIFO order is : 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 starting from current head position, what is total distance travelled(in cylinders) by disk arm to satisfy the requests using FCFS,SSTF,SCAN and look algorithms.
11.	Explain SCAN and C-SCAN disk scheduling.
12.a.	Explain the various components of a Linux system.
b.	Explain process scheduling in a Linux system.
c.	Explain file systems implementation in Linux.
13.	Discuss how memory management is dealt with in Linux operating system.
14.	Write short note on: a) process management in Linux. b) Linux filesystem. c) Benefits of multi- threading. d) Inter-process communication.
15.	Write a short note on Linux virtual memory system.
16.	Write short notes on : a. Linux history b. Components of a Linux system.
17.	Explain the Linux device drive block structure.
18.	What are the design principles of Linux operating systems? Explain

kuw

CITY ENGINEERING COLLEGE
DEPARTMENT OF CSE/ISE/ALML
ASSIGNMENT 1

SUBJECT - OPERATING SYSTEMS

SUB CODE: 21CS44

SEMESTER - IV

SECTION: A,B,C,D

1. Draw Gantt charts using the following scheduling algorithms :FCFS,SJF, SRTF,RR,(quantum=2), for the following set of processes. Also calculate .The average waiting time and average turn around time.

i.

Process	Arrival Time	Burst Time
P1	0	6
P2	1	3
P3	2	1
P4	3	4

ii.

Process	Arrival Time	Burst Time
P1	0	9
P2	1	4
P3	2	9
P4	3	5

iii

Process	Arrival Time	Burst Time
P1	0	6
P2	2	3
P3	4	3
P4	5	5

2. Draw Gantt charts using the following scheduling algorithms :FCFS,SJF, SRTF,RR,Priority (quantum=2,higher the number higher the priority) for the following set of processes. Also calculate The average waiting time and average turn around time.

i.

Process	Arrival Time	Burst Time	Priority
P1	0	10	3
P2	0	1	1
P3	3	2	3
P4	5	1	4
P5	10	5	2

ii.

Process	Arrival Time	Burst Time	Priority
P1	0	10	10
P2	0	1	20
P3	1	2	40
P4	2	4	30
P5	2	3	50

iii.

Process	Arrival Time	Burst Time	Priority
P1	0	9	3
P2	0	5	1
P3	2	6	5
P4	3	7	2

3. Apply banker's algorithm to answer the following
- What is the content of need matrix?
 - Is the system is in a safe state.
 - If a request from a process P2(0 0 2) arrives, can it be granted?

Process	allocation			maximum			available		
	A	B	C	A	B	C	A	B	C
P0	0	0	2	0	0	4	1	0	2
P1	1	0	0	2	0	1			
P2	1	3	5	1	3	7			
P3	6	3	2	8	4	2			
P4	1	4	3	1	5	7			

4. Find the safe sequence using banker's algorithm. the number of resource units are A,B,C which are 7,7,10 respectively.

Process	allocation			maximum			available		
	A	B	C	A	B	C	A	B	C
P0	2	2	3	3	6	8			
P1	2	0	3	4	3	3			
P2	1	2	4	3	4	4			

5. Apply banker's algorithm to answer the following
- What is the content of need matrix?
 - Is the system is in a safe state.
 - If a request from a process P1(0 4 2 0) arrives, can it be granted?

Process	allocation				maximum				available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Law

CITY ENGINEERING COLLEGE
DEPARTMENT OF CSE/ISE/AIML
ASSIGNMENT 2

SUBJECT - OPERATING SYSTEMS

SUB CODE: 21CS44

SEMESTER - IV

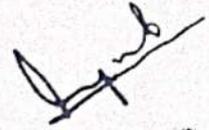
SECTION: A,B,C,D

1. for the given reference string 7,0,1,2,3,0,3,0,4,2,3,0,3,2,1,2,0,7,1,0 assuming frame size if 4, apply FIFO,OPTIMAL,LRU algorithms. find which algorithm is efficient.
2. Consider the page reference string 1,0,7,1,0,2,3,0,3,2,4,0,3,6,2,1 for a memory with 3 frames.determine the number of page faults using FIFO,OPTIMAL,LRU replacement algorithms.which algorithm is most efficient.
3. For the following page reference string 1,2,3,4,1,2,5,1,2,3,4,5 calculate the page faults using FIFO and LRU for memory with 3 and 4 frames.
- 4.Consider the following page reference string 7,0,1,2,0,3,0,4,2,3,0.calculate the number of page faults,when the number of page frame is 3,using FIFO and LRU page replacement algorithms
- 5.apply disk scheduling algorithm FCFS,SSTF,SCAN and LOOK for the following cylinders.starting position of cylinder is at 85.pending request in order 92,113,35,67,89,145,198.
- 6.a drive has 5000 cylinders.numbered 0 to 4999.the drive is currently serving a request at 143 and previously serviced request at 125.the queue of pending request in FIFO order is 86,1470,913,1774,948,1509,1022,1750,130.starting from current head positon,what is the total distance travelled by disk arm to satisfy the request using FCFS,SSTF,SCAN,LOOK nad C-LOOK algorithms.
- 7.given the following sequence 95,180,34,119,11,123,62,64 with the head initially at track 50.ending at track 199.what is the total disk traveled by the disk arm to satisfy the request using FCFS,SSTF,LOOK and C-LOOK algorithms.
- 8.Consider a disk queue with request for I/O to blocks on following cylinders in order 98,183,37,122,14,124,65,67.IF THE DISK HEAD IS INITIALLY AT 53.calculate the total head movements,when the following scheduling are used. i) FCFS ii) SSTF
9. Given memory partitions of 100K,500K,200K,300K and 600K,apply first fit and best fit , worst fit algorithm to place 212K,417 K,112 K and 426K.
10. Given memory partitions of 200K,700K,500K,300K,100K,400K. apply first fit and best fit , worst fit algorithm to place 315K,427K,250K,550K.

[Signature]

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**CITY ENGINEERING COLLEGE
FIRST INTERNAL TEST**



Program Name: CSE/ISE/AI&ML
Course Name : Operating Systems
Sem & Sec: IV SEM A, B, C, D

Max Marks: 40

Date: 11/07/2023
Time: 02:30PM – 04:00PM
Duration: 1 ½ hrs.

Note: Answer all Questions selecting any ONE FULL question from each part.

Q No.	SQ No.	Questions	Marks	BT Levels	CO's
<i>PART - A</i>					
1		Define operating systems. With a neat diagram explain the dual mode operation of operating system.	10	BT1, BT2	CO1
<i>Or</i>					
2		Demonstrate the operations of process creation and process termination.	10	BT2	CO1
<i>PART - B</i>					
3		Analyze the following operating system structures with a neat diagram. a) Simple structures b) Microkernel c) Layered approach	10	BT2	CO1
<i>Or</i>					
4		Explain operating system services with respect to user and system.	10	BT2	CO1
<i>PART - C</i>					
5		With a neat diagram explain the concept of virtual machines, with examples.	10	BT2	CO1
<i>Or</i>					
6		With neat diagram explain the following i) Process states ii) Process Control Block.	10	BT2	CO1
<i>PART - D</i>					
7		What are system calls? Briefly explain types of system calls.	10	BT1, BT2	CO1
<i>Or</i>					
8		What is IPC? Explain the Shared Memory and Message Passing IPC in detail.	10	BT1, BT2	CO1

Bloom's Taxonomy Level: BT1-Remembering BT2-Understanding BT3-Applying BT4-Analysing BT5-Evaluating BT6-Creating

Course Outcomes:

- CO 1. Identify the structure of an operating system and its scheduling mechanism.
- CO 2. Demonstrate the allocation of resources for a process using scheduling algorithm.
- CO 3. Identify root causes of deadlock and provide the solution for deadlock elimination
- CO 4. Explore about the storage structures and learn about the Linux Operating system.
- CO 5. Analyze Storage Structures and Implement Customized Case study

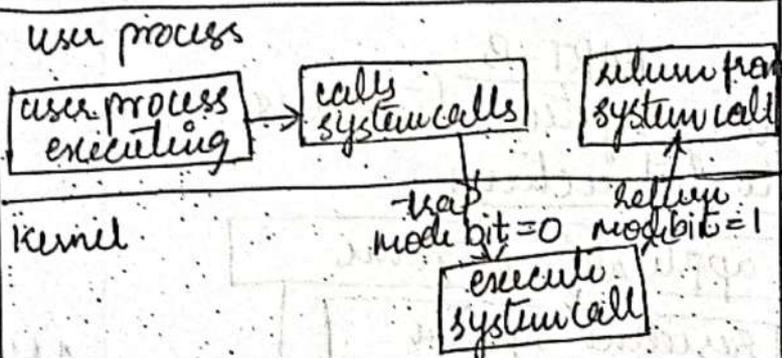
CITY ENGINEERING COLLEGE
DEPARTMENT OF CSE

SCHEME FOR VALUATION

Internal Test I

Semester & Section: IV (A,B,C,D)

Date: 11/7/23

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<p align="center"><u>Part - A</u></p> <p>definition of OS dual-mode operation</p>  <pre> graph TD subgraph User_Process [User process] direction TB U1[user process executing] -- calls system calls --> SC1[] end subgraph Kernel [kernel] direction TB SC2[] -- execute system call --> SC1 SC1 -- return from system call --> U1 end style SC1 fill:none,stroke:none </pre> <p>mode bit = 1</p> <p>mode bit = 0</p>	<p>2M 8M</p>	<p>10M</p>
2.	<p><u>process operations</u> <u>process creation:</u></p> <pre> int main() { pid_t pid; pid = fork(); if (pid < 0) { printf(stderr, "fork failed"); exit(-1); } else if (pid == 0) { execlp("/bin/ls", "ls", NULL); } else { wait(NULL); printf("child complete"); exit(0); } } </pre>	<p>5M</p>	

[Signature]
Staff

[Signature]
HOD

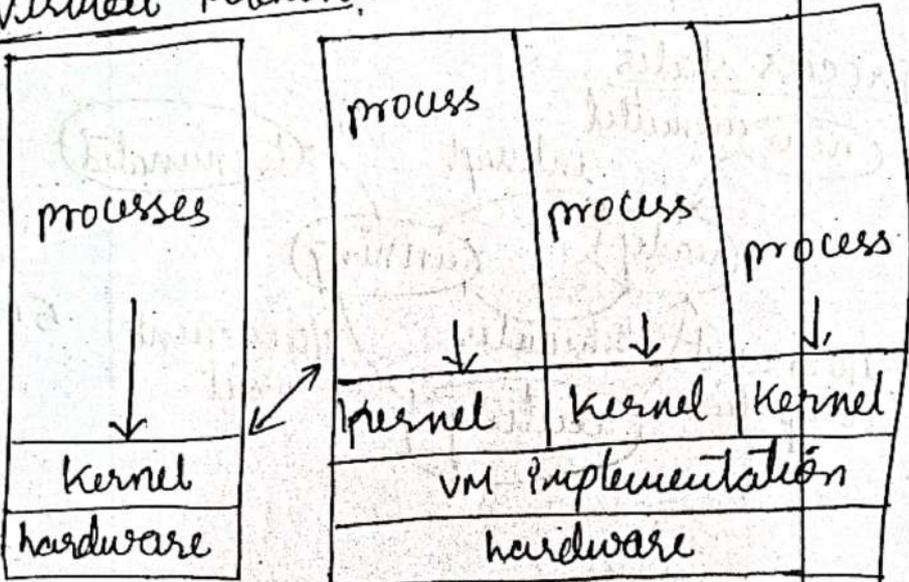
CITY ENGINEERING COLLEGE
DEPARTMENT OF CSE

SCHEME FOR VALUATION

Internal Test I

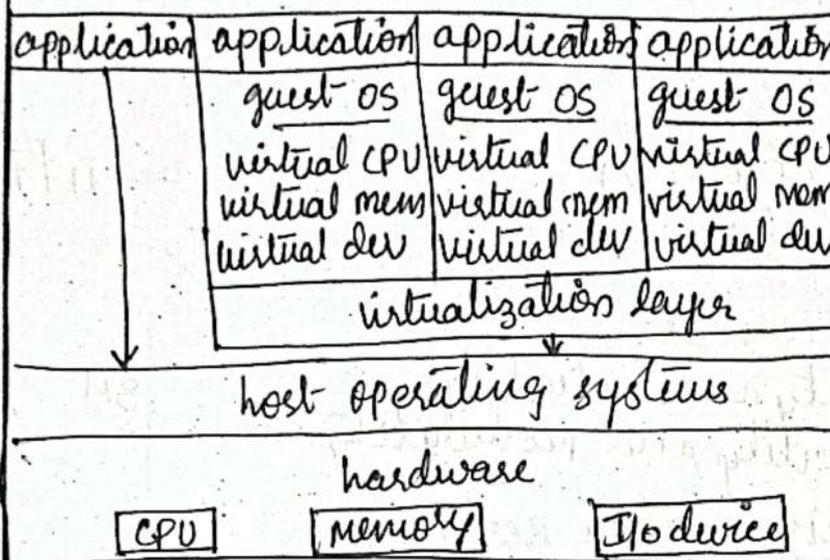
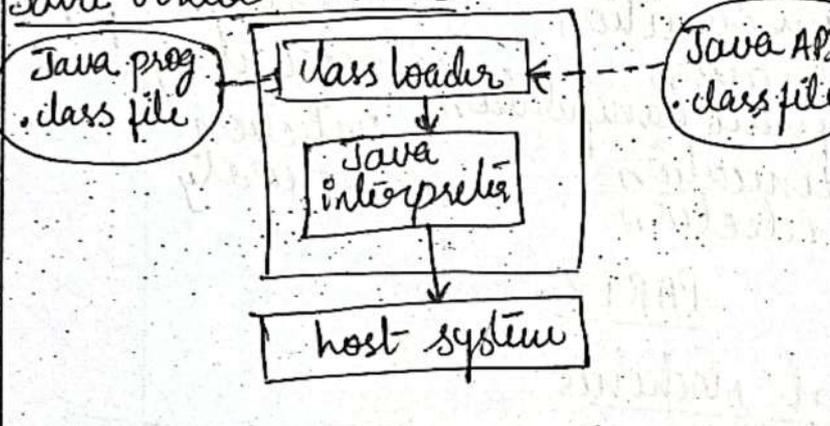
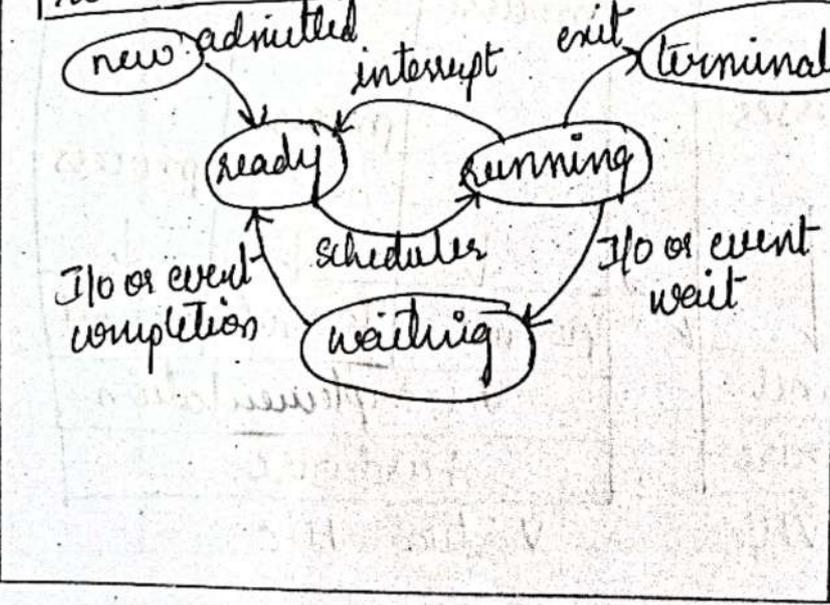
Semester & Section: IV (A, B, C, D)

Date: 11/7/23

Question No.	Details of the Answer	Marks Distribution	Total Marks
3)	<u>micro kernels</u> security and reliability probability and modularity	3M	10M
4.	<u>operating system services</u> 1. user interface 2. program execution 3. I/O operation 4. file system manipulation 5. communication 6. error detection 7. resource allocation 8. accounting 9. protection and security	10M	10M
<u>PART C</u>			
5.	<u>virtual machines</u> 	4M	

[Signature]
Staff

[Signature]
10/1

Question No.	Details and Answer	Marks Distribution	Total Marks
1)	<p><u>VMware</u></p>  <p>The diagram shows a stack of layers. At the top, there are four 'application' boxes. Below them are three 'guest OS' boxes. Each guest OS box contains 'virtual CPU', 'virtual mem', and 'virtual dev'. These three layers are grouped by a bracket labeled 'virtualization layer'. Below this is the 'host operating systems' layer. At the bottom is the 'hardware' layer, which includes 'CPU', 'memory', and 'I/O device' boxes. Arrows indicate the flow of data and control between these layers.</p>	3M	10M
	<p><u>Java virtual machine</u></p>  <p>The flowchart shows the execution of a Java program. It starts with a 'Java prog. class file' (circled) which is processed by a 'class loader' (in a box). A 'Java API class file' (circled) also feeds into the 'class loader'. An arrow points from the 'class loader' to a 'Java interpreter' (in a box). From the 'Java interpreter', an arrow points to the 'host system' (in a box).</p>	3M	
6.	<p><u>Process states</u></p>  <p>The diagram illustrates the lifecycle of a process through various states: <ul style="list-style-type: none"> new (circled) transitions to admitted (circled). admitted transitions to ready (circled). ready transitions to running (circled) via the scheduler. running can transition to waiting (circled) due to I/O or event wait. waiting transitions back to ready upon I/O or event completion. running can transition to terminated (circled) via exit. interrupt can also lead to ready. </p>	5M	

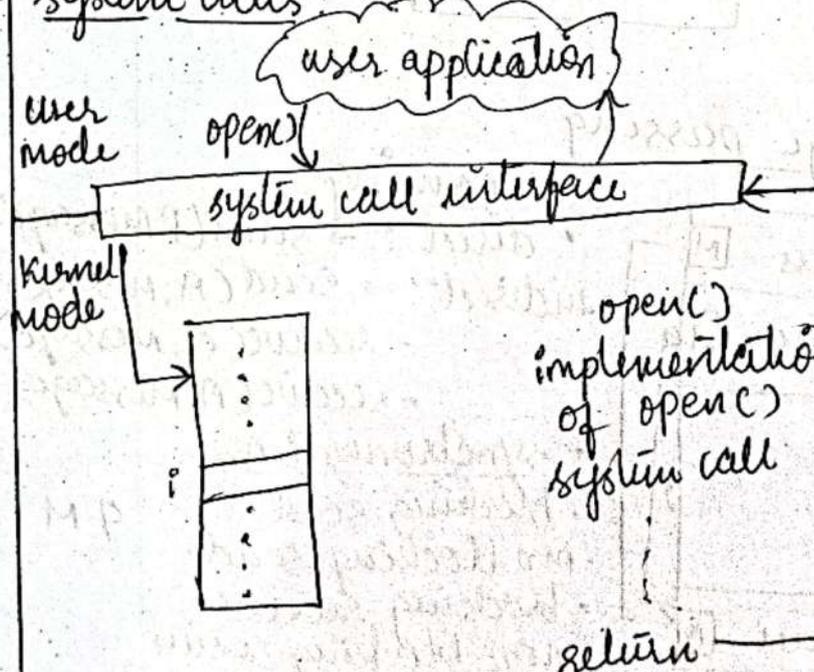
CITY ENGINEERING COLLEGE
DEPARTMENT OF CSE

SCHEME FOR VALUATION

Internal Test I

Semester & Section: IV (A, B, C, D)

Date: 11/7/23

Question No.	Details of the Answer	Marks Distribution	Total Marks							
	<p><u>process control block:</u></p> <table border="1" style="display: inline-table; vertical-align: top;"> <tr><td>process status</td></tr> <tr><td>process number</td></tr> <tr><td>program counter</td></tr> <tr><td>register</td></tr> <tr><td>memory limits</td></tr> <tr><td>list of files</td></tr> <tr><td>...</td></tr> </table> <ul style="list-style-type: none"> • process status • program counter • CPU register • CPU scheduling information • memory mang. • accounting infor. • I/O status infor. • Threads <p align="center"><u>PART-D</u></p> <p>7. <u>system calls:</u></p>  <p style="text-align: right;">5M</p>	process status	process number	program counter	register	memory limits	list of files	...	5M	10M
process status										
process number										
program counter										
register										
memory limits										
list of files										
...										

[Signature]
Staff

[Signature]
HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
--------------	-----------------------	--------------------	-------------

Types of system calls

1. process control
2. file management
3. device management
4. Information maintenance
5. communication

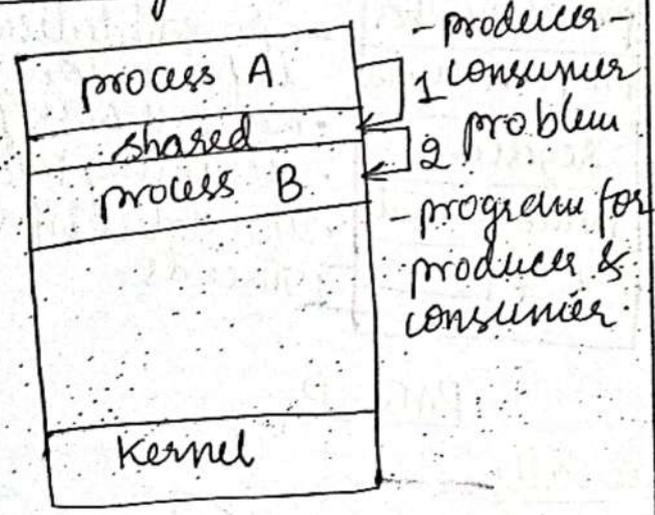
5M

10M

8. definition of IPC

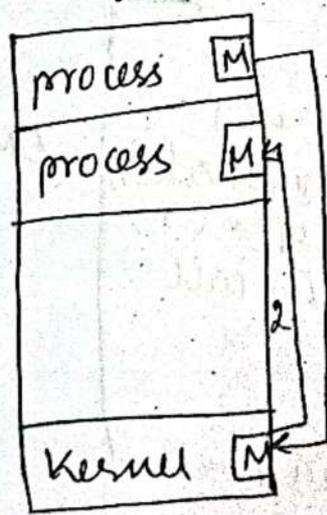
2M

1. shared memory



4M

2. Message passing



- naming
- direct: $\rightarrow \text{send}(P, \text{message})$
- indirect: $\rightarrow \text{send}(A, \text{message})$
- receive(B, message)
- receive(A, message)
- synchronization
- blocking send
- non-blocking send
- blocking receive
- non-blocking receive
- buffering
- zero capacity
- Bounded capacity
- unbounded capacity

10M

4M

Year : 2022 - 2023

Semester : Odd / Even

Name of the Teacher : LAXMI. M. C

Designation : Asst. Professor

Department : CSE

Sem/Branch	Subject Code	Subject
1. <u>IV</u>	<u>21CS44</u>	<u>OPERATING SYSTEMS</u>
2. ....	.....	.....
3. ....	.....	.....

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff				
HOD				
Principal				

ATTENDANCE

Sl. No.	Reg. No.	Name											
			2	4	2	3	2	4	2	3	2	2	3
1	1CE21CS001	A C VIMAL GOWDA	1	2	3	4	5	5	6	7	8	9	10
2	002	ABHISHEK M G	1	2	3	4	4	5	6	7	8	9	10
3	005	AJAY	0	2	2	3	4	5	6	7	7	8	9
4	006	AKSHITHA S	1	2	3	4	5	6	7	8	9	9	10
5	008	ANAND	1	2	3	4	5	6	7	8	8	9	10
6	009	ANANYA YADAV	1	2	3	4	5	6	7	8	9	9	9
7	010	ANTANEYA V	1	2	2	3	4	5	6	7	8	9	10
8	012	ANKUSH KUMAR	1	2	3	4	5	6	7	8	9	10	11
9	013	ASHTISH S D	1	2	3	4	5	6	7	8	9	10	11
10	015	ASHWINI S	1	2	3	4	5	6	7	8	9	10	11
11	016	AYESHA KALEEM	0	1	2	3	4	5	5	6	7	8	9
12	017	BEERESH N	1	2	3	4	5	6	7	8	8	9	10
13	019	BHARATH KUMAR J	1	2	3	4	4	5	6	7	8	9	9
14	020	BHARATH REDDY G	1	2	3	4	5	6	7	8	9	10	10
15	022	BHARATH S	0	1	2	3	4	5	6	7	8	9	10
16	024	CHANDRALEKHA S	1	2	3	4	5	6	7	8	9	10	11
17	025	CHANDRASHEKAR M R	0	1	2	3	4	5	6	7	8	9	10
18	026	CHEETHAN H S	1	2	3	4	5	6	7	7	8	9	10
19	027	CHINMAYI L	1	2	3	4	5	5	6	7	8	9	10
20	029	DARSHAN K M	1	1	2	3	4	5	6	7	8	9	10
21	031	DARSHAN M Y	1	2	3	4	4	5	6	7	8	9	10
22	032	DARSHAN S	1	2	3	4	5	6	7	8	8	9	10
23	034	DHANUSH R	1	2	3	4	5	6	7	8	9	10	11
24	035	DIKSHA P S	1	2	3	4	5	6	7	8	9	9	10
25	036	G S BHARATHI	1	2	3	4	5	6	7	8	9	10	10
No. of Absents			4	0	0	0	2	1	1	1	2	3	3
Initials													

ASSESSMENT

Sl. No.	Reg. No.	Name	Test Marks											Sessional Marks	Remarks	
			1	2	3	4	5	6	7	8	9	10	11		A1	A2
1	1CE21CS001	A C VIMAL GOWDA	15	12	13	9	18	5	10	10	40					
2	002	ABHISHEK M G	8	13	7	9	15	05	10	10	33					
3	005	AJAY	8	10	8	10	16	5	10	10	32					
4	006	AKSHITHA S	16	20	20	9	16	5	10	10	47					
5	008	ANAND	13	14	7	9	16	5	10	10	36					
6	009	ANANYA YADAV	19	20	19	9	17	5	10	10	48					
7	010	ANTANEYA V	8	9	10	9	16	4	10	10	32					
8	012	ANKUSH KUMAR	9	9	8	10	19	5	10	10	33					
9	013	ASHTISH S D	15	15	9	10	15	5	10	10	39					
10	015	ASHWINI S	19	20	20	10	20	5	10	10	50					
11	016	AYESHA KALEEM	17	18	16	10	17	5	10	10	45					
12	017	BEERESH N	9	13	5	10	15	5	10	10	33					
13	019	BHARATH KUMAR J	15	20	AB	9	18	4	10	10	37					
14	020	BHARATH REDDY G	20	20	20	9	20	5	10	10	50					
15	022	BHARATH S	10	11	9	9	18	5	10	10	33					
16	024	CHANDRALEKHA S	19	14	12	9	18	5	10	10	42					
17	025	CHANDRASHEKAR M R	10	6	10	9	18	5	10	10	33					
18	026	CHEETHAN H S	13	15	10	10	13	5	10	10	38					
19	027	CHINMAYI L	20	20	20	10	15	5	10	10	49					
20	029	DARSHAN K M	9	15	10	10	12	5	10	10	35					
21	031	DARSHAN M Y	11	16	AB	9	18	5	10	10	33					
22	032	DARSHAN S	8	13	5	9	12	5	10	10	31					
23	034	DHANUSH R	9	13	11	4	13	5	10	10	34					
24	035	DIKSHA P S	17	20	19	9	18	5	10	10	48					
25	036	G S BHARATHI	11	8	10	8	11	5	10	10	32					
No. of Absents			1	2	3	0	2	0	3	2	2	2				
Initials																

ATTENDANCE

Sl. No.	Reg. No.	Name
1	1CE21CS001	A C. VIMAL GOWDA
2	002	ABHISHEK M G
3	005	AJAY
4	006	AKSHITHAS
5	008	ANAND
6	009	ANANYA YADAV
7	010	ANJANEYA V
8	012	ANKUSH KUMAR
9	013	ASHISH S D
10	015	ASHWINT S
11	016	AYESHA KALEEM
12	017	BEERESH N
13	019	BHARATH KUMAR J
14	020	BHARATH REDDY G
15	022	BHARATH S
16	024	CHANDRALEKHA S
17	025	CHANDRASHEKAR M R
18	026	CHEZHAN H S
19	027	CHINMAYI L
20	029	DARSHAN K M
21	031	DARSHAN M Y
22	032	DARSHAN S
23	034	DHANUSH R
24	035	DIKSHA P S
25	036	G S BHARATHI
	No. of Absents	
	Initials	

T	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
20	20	21	22	23	24	25	26	27	28	29	30	31																			
20	21	22	23	24	25	26	27	28	29	30	31																				
19	20	21	22	23	24	25	26	27	28	29	30	31																			
21	22	23	24	25	26	27	28	29	30	31																					
19	20	21	22	23	24	25	26	27	28	29	30	31																			
19	20	21	22	23	24	25	26	27	28	29	30	31																			
18	19	20	21	22	23	24	25	26	27	28	29	30	31																		
21	22	23	24	25	26	27	28	29	30	31																					
21	22	23	24	25	26	27	28	29	30	31																					
19	20	21	22	23	24	25	26	27	28	29	30	31																			
20	21	22	23	24	25	26	27	28	29	30	31																				
21	22	23	24	25	26	27	28	29	30	31																					
21	22	23	24	25	26	27	28	29	30	31																					
21	22	23	24	25	26	27	28	29	30	31																					
20	21	22	23	24	25	26	27	28	29	30	31																				
19	20	21	22	23	24	25	26	27	28	29	30	31																			
	0	1	2	2	0	0	0	0	1	2																					

ASSESSMENT

	5	2	3	4	3	2	3	4	2	1
32	33	34	35	36	37	38	39	40	41	
28	29	30	31	32	33	34	35	36	37	
29	30	31	32	33	34	35	36	37	38	
28	29	30	31	32	33	34	35	36	36	
30	31	32	33	34	35	36	37	38	39	
29	30	30	31	32	33	34	35	36	37	
27	28	29	30	31	32	33	34	35	36	
28	29	30	31	32	33	34	35	36	36	
28	29	30	31	32	33	34	35	36	36	
28	29	30	31	32	33	34	35	36	36	
30	31	32	33	34	35	36	37	38	39	
31	32	33	34	35	36	37	38	39	40	
29	30	30	31	32	33	34	35	36	37	
28	29	30	31	32	33	34	35	36	37	
29	30	30	31	32	33	34	35	36	36	
30	31	32	33	34	35	36	37	38	39	
31	32	33	34	35	36	37	38	39	40	
29	30	30	31	32	33	34	35	36	37	
28	29	30	31	32	33	34	35	36	37	
29	30	30	31	32	33	34	35	36	36	
30	31	32	33	34	35	36	37	38	39	
30	31	32	33	34	35	36	37	38	39	
28	29	30	31	32	33	34	35	36	37	
28	29	30	31	32	33	34	35	36	36	
30	31	32	33	34	35	36	37	38	39	
30	31	32	33	34	35	35	36	37	38	
28	29	30	31	32	33	34	35	36	37	
30	31	32	33	34	35	35	36	37	38	
29	30	31	32	33	34	35	36	36	37	
31	32	33	34	35	36	37	38	39	40	
28	29	30	31	31	32	33	34	35	36	
20	28	29	30	31	32	33	34	35	36	
2	3	1	1	0	0	1	0	1	0	

n.	Test Marks					Sessional Marks	Remarks		
	1	2	3	A ₀	A ₂		A ₁	A ₂	
	15	12	13	9	18	5	10	10	40
	8	13	7	9	15	05	10	10	33
	8	10	8	10	16	5	10	10	32
	16	20	20	9	16	5	10	10	47
	13	14	7	9	16	5	10	10	36
	19	20	19	9	17	5	10	10	48
	8	9	10	9	16	4	10	10	32
	9	9	8	10	19	5	10	10	33
	15	15	9	10	15	5	10	10	39
	19	20	20	10	20	5	10	10	50
	17	18	16	10	17	5	10	10	45
	9	13	5	10	15	5	10	10	33
	15	20	AB	9	18	4	10	10	37
	20	20	20	9	20	5	10	10	50
	10	11	9	9	18	5	10	10	33
	19	14	12	9	18	5	10	10	42
	10	6	10	9	18	5	10	10	33
	13	15	10	10	13	5	10	10	38
	20	20	20	10	15	5	10	10	49
	9	15	10	10	12	5	10	10	35
	11	16	AB	9	18	5	10	10	33
	8	13	5	9	12	5	10	10	31
	9	13	11	4	13	5	10	10	34
	17	20	19	9	18	5	10	10	48
	11	8	10	8	11	5	10	10	32

CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN 2022 - 23

SUBJECT: Operating System
FACULTY NAME: Mrs. Laxmi M C
SUBJECT CODE: 21CS44

SEM: IV

SEC: A

Week	Date		Topics Planned
	From	To	
I	05-06-23	10-06-23	Introduction to operating systems, System structures: What operating systems do; Computer System organization; Computer System architecture; Operating System structure; Operating System operations; Process management
II	12-06-23	16-06-23	Memory management; Storage management; Protection and Security; Distributed system; Special-purpose systems; Computing environments; Operating System Services; User - Operating System interface; System calls; Types of system calls:
III	19-06-23	24-06-23	System programs; Operating system design and implementation; Operating System structure; Virtual machines; Operating System generation; System boot; Process Management Process concept; Process scheduling; Operations on processes; Inter process communication
IV	26-06-23	30-06-23	Multi-threaded Programming: Overview; Multithreading models; Thread Libraries; Threading issues. Process Scheduling: Basic concepts; Scheduling Criteria
V	03-07-23	08-07-23	Revision ; FIRST CIE
VI	10-07-23	14-07-23	Scheduling Algorithms; Multiple-processor scheduling; Thread scheduling.
VII	17-07-23	22-07-23	Process Synchronization: Synchronization: The critical section problem; Peterson's solution; Synchronization hardware; Semaphores; Classical problems of synchronization; Monitors.
VIII	24-07-23	29-07-23	Deadlocks: Deadlocks; System model; Deadlock characterization; Methods for handling deadlocks, Deadlock prevention: Deadlock avoidance, Banker's Algorithm
IX	31-07-23	04-08-23	Deadlock detection and recovery from deadlock; Memory Management: Memory management strategies; Background: Swapping

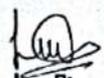
CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN

SUBJECT: Operating System
FACULTY NAME: Mrs. Laxmi M C
SUBJECT CODE: 18CS43

SEM: IV

SEC: A

Week	Date		Topics Planned
	From	To	
X	07-08-23	12-08-23	Contiguous memory allocation; SECOND CIE
XI	14-08-23	18-08-23	Paging; Structure of page table; Segmentation. Virtual Memory Management: Background; Demand paging; Copy-on-write; Page replacement
XII	21-08-23	26-08-23	Allocation of frames; Thrashing. File System, Implementation of File System: File system: File concept; Access methods; Directory structure
XIII	28-08-23	01-09-23	File system mounting; File sharing; Protection; Implementing File system: File system structure; File system implementation; Directory implementation, Allocation methods; Free space management; Secondary Storage Structures, Protection: Mass storage structures; Disk structure; Disk attachment
XIV	04-09-23	09-09-23	Disk scheduling; Disk management; Swap space management; Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix, Implementation of access matrix, Access control, Revocation of access rights, Capability- Based systems. Case Study: The Linux Operating System: Linux history; Design principles; Kernel modules
XV	11-09-23	15-09-23	Process management; Scheduling; Memory Management; File systems, Input and output; Inter-process communication.
15-09-2023			Last Working Day


 Teacher Signature


 HOD Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
4/6/23	2	Module-1: OS, computer system organization
7/6/23	4	operating system structures and operations
8/6/23	2	process management & memory management
9/6/23	3	protection and security, distributed systems
12/6/23	2	special purpose systems, computing environment
14/6/23	4	operating system services
15/6/23	2	user-operating system interface
16/6/23	3	system calls and types of system calls
19/6/23	2	system programs and its types
22/6/23	2	operating system structures
23/6/23	3	Virtual machines (VMware & JVM)
26/6/23	2	process and process status, scheduling
27/6/23	4	process operations (creation & termination)
27/6/23	5	Inter process communication (message passing, shared memory)
7/7/23	3	Module-2: multi-threaded models, thread libraries
13/7/23	2	threading issues, process scheduling
14/7/23	3	scheduling algorithms, multi process scheduling
18/7/23	5	scheduling, thread scheduling.
19/7/23	4	The critical section problem, Peterson problem, Semaphores, monitors
20/7/23	2	classical problems of synchronization
24/7/23	2	Module-3: deadlock characterization, methods for handling deadlock, deadlock prevention
25/7/23	2	deadlock avoidance, deadlock detection
25/7/23	5	
26/7/23	2	



.....
Teacher's Signature



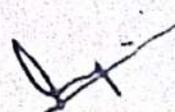
.....
HOD'S Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
26/7/23	3	memory management strategies,
31/7/23	2	Swapping, continuous memory
2/8/23	4	allocation, paging, segmentation
3/8/23	2	structure of page table.
7/8/23	2	Module-4 Demand paging, copy on write
14/8/23	2	page replacement, allocation of frames
16/8/23	3	thrashing, file system, access methods
17/8/23	5	Directory structures, implementing
22/8/23	2	file system, file system structure
28/8/23	3	implementation of files and directories
29/8/23	4	allocation methods, free space mang.
29/8/23	3	Module-5 disk structure, disk attachment
30/8/23	2	disk scheduling, disk management,
30/8/23	3	swap space management, protection
31/8/23	4	Access matrix, access control.
1/9/23	2	linux operating system - case study
15/9/23	1	windows operating system - case study



 Teacher's Signature



 HOD'S Signature



CITY
ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CIRCULAR

Ref. No: CEC/CSE/DAC/ACY 2022-2023/01

Date: 08-08-2022

This is to inform the members of Department Advisory Committee that meeting is scheduled on 12/08/2022 at 11: 00 AM in CSE department at Lab C107.

Agenda:

- Discussion on 21 Scheme
- Encouraging students participation in hackathon
- Bootcamp programme for third year students
- Alumni Interaction
- Conducting workshop/seminar/guest lectures


Dr. Sowmya Naik P T

HOD



CITY
ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Department Advisory Committee Meeting

Date: 12/08/2022

Time: 11:00 AM

Venue: Room No. C107

DAC Members Present:

Sl. No	Member Name	Designation	Role	Sign
1	Dr. Sowmya Naik P T	HOD	Convenor	
2	Dr. Nandakumar A N	Professor	Member	
3	Mrs. Ambika P R	Assistant Professor	Co-Convenor	
4	Mrs. Laxmi M C	Assistant Professor	Member	
5	Mr. Girish G A	Assistant Professor	Member	
6	Mrs. Archana Bhat	Assistant Professor	Member	
7	Mrs. Shashikala H C	Assistant Professor	Member	
8	Mr. Vinodh Kumar S	Assistant Professor	Member	
9	Mrs. Sangeeta Uranakar	Assistant Professor	Member	
10	Mr. Narasimha Prasad K L	Project Manager, Accenture Services Pvt. Ltd	Alumni (Industry Expert)	
11	Mr. Mujtaba Nayaz	Data Analyst, Infosys	Alumni	

The Department Advisory Committee meeting was conducted at Department of CSE, on 12th August, 2022, at 11 AM.

Agenda of the Meeting:

- Discussion on 21 Scheme
- Encouraging students participation in hackathon
- Bootcamp programme for third year students
- Alumni Interaction
- Conducting workshop/seminar/guest lectures



CITY
ENGINEERING COLLEGE

Minutes of Meeting:

During the Department Advisory Committee meeting, a comprehensive overview of the department was presented, highlighting student achievements as well as faculty accomplishments and contributions. The members engaged in a discussion on suggestions for improvement and reviewed the meeting agenda.

The following key points were addressed during the meeting:

- It was discussed that students entering their third semester are required to complete a three-week internship under the 21 Scheme. The committee deliberated on the guidelines and evaluation criteria for this internship.
- A hackathon is scheduled for December. Faculty members were encouraged to motivate students to actively participate in this event.
- With the growing demand for full stack development in the industry, a proposal was made to conduct a bootcamp program for third-year students.
- Mr. Mujtaba Nayaz provided insights into current industry trends and the challenges students face when entering the software industry. Consequently, the committee decided to organize an alumni interaction session to address these challenges.
- To enhance the technical skills of both students and faculty, the committee agreed on the need to conduct workshops or guest lectures on emerging technologies in the near future.


Dr. Sowmya Naik P T
HOD & Convenor

Academic Calendar for ODD Semester of UG programs for the year 2022-23

	I semester B.E./B.Tech.	I semester B.Arch./B.Plan	I semester B.Sc.	III semester B.E./ B.Tech.	III Semester B.Arch.	III semester B. Plan	III Semester B.Sc.	V Semester B.E./B.Tech.	V Semester B.Arch./ B.Plan.	VII semester B.E./B.Tech.	VII semester B.Plan.	VII semester B.Arch	IX semester B.Arch
Commencement of ODD Semester	# 10.10.2022	# 10.10.2022	10.10.2022 (Tentative)	11.10.2022	31.10.2022	31.10.2022	10.10.2022	10.10.2022	12.09.2022	21.08.2022	21.08.2022	19.09.2022	01.09.2022
Internship				11.10.2022 To 30.10.2022						21.08.2022 To 17.09.2022	21.08.2022 To 24.09.2022		
Commencement of Classes				31.10.2022	31.10.2022	31.10.2022	10.10.2022	10.10.2022	12.09.2022	19.09.2022	26.09.2022	19.09.2022	01.09.2022
Last Working day of ODD Semester				11.02.2023	11.02.2023	11.02.2023	28.01.2023	27.01.2023	31.12.2022	31.12.2022	07.01.2023	31.12.2022	20.12.2022
Practical Examination				13.02.2023 To 21.02.2023	13.02.2023 To 21.02.2023	13.02.2023 To 21.02.2023	01.02.2023 To 09.02.2023	30.01.2023 To 09.02.2023	03.01.2023 To 13.01.2023	03.01.2023 To 13.01.2023	09.01.2023 To 14.01.2023	03.01.2023 To 13.01.2023	21.12.2022 To 31.12.2022
Theory Examinations				22.02.2023 To 22.03.2023	22.02.2023 To 22.03.2023	22.02.2023 To 22.03.2023	13.02.2023 To 03.03.2023	13.02.2023 To 18.03.2023	16.01.2023 To 15.02.2023	16.01.2023 To 15.02.2023	16.01.2023 To 15.02.2023	16.01.2023 To 15.02.2023	---
Internship			*	26.03.2023 To 16.04.2023	---	---	---	---	---	---	---	---	---
Internship Viva Voce/ Project viva				---	---	---	---	---	---	---	---	---	---
Commencement of EVEN Semester				17.04.2023	17.04.2023	17.04.2023	20.03.2023	20.03.2023	20.03.2023	20.02.2023	20.02.2023	20.02.2023	06.01.2023

Please Note:

- The academic sessions for ODD semesters should commence from the dates mentioned above. # Commencement of Induction Program As per AICTE Academic Calendar 2022-23
- The commencement date of VII semester B.E./B.Tech/, is postponed from 12.09.2022 to 19.09.2022 to cover 04 weeks of Internship duration. The students of B.E./B.Tech., compulsorily have to complete the Internship in this duration only.
- The commencement date of VII semester B.Plan., is postponed from 12.09.2022 to 26.09.2022 to cover 06 weeks of Internship duration.
- Students joining to VII semester B.E./B.Tech./B.Plan should complete the Internship before the commencement of the classes.
- The Institute needs to function for six days a week with additional hours (Saturday is a full working day). #if required, the college can also plan to have extra classes on Sundays to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University Examinations will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar may be modified based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Academic Calendar is also applicable for Autonomous Colleges. if any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- The college has to conduct offline classes to cover 80% of the syllabus of the courses; however, 20% of the syllabus can be covered in virtual model (Online) mode. Attendance of the students for offline and online classes is mandatory and records should be maintained and submitted to the university whenever informed.
- If any clarification/correction, please email to sbhvtuso@gmail.com

* Internship for Lateral Entry Students

Ray *03/09/2022* BE
REGISTRAR
27/3/22



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (Odd SEM)

SEPTEMBER 2022		OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEB 2023		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
WED					2						1	
THU	1				3		1				2	3 rd sem - III CIE
FRI	2				4		2			3		
SAT	3		1		5		3			4		
SUN	4		2		6		4		1		5	
MON	5		3		7		5		2		6	
TUE	6		4	Ayudha pooja	8		6		3	3 rd -II CIE 7 th sem vtU practical exam starts	7	
WED	7		5	Vijaya dashami	9		7		4		8	
THU	8		6		10		8		5		9	
FRI	9		7		11	Kanakadasa Jayanthi	9		6		10	
SAT	10	2 nd Saturday holiday	8	2 nd Saturday holiday	12	2 nd Saturday holiday	10	2 nd Saturday holiday	7		11	3 rd Sem LWD 2 nd Saturday holiday
SUN	11		9		13		11		8		12	
MON	12		10	START OF 5 TH SEM / START OF I SEM	14	5 th I CIE	12	5 th sem II CIE	9		13	5 th sem theory exam 3 rd sem practical exam
TUE	13		11		15		13		10		14	
WED	14		12		16		14		11		15	
THU	15		13		17		15		12		16	
FRI	16		14		18		16		13		17	
SAT	17		15		19		17		14	2 nd Saturday holiday	18	
SUN	18		16		20		18		15	Makara Sankranthi	19	
MON	19	START OF 7 TH SEMESTER	17	7 th sem-I CIE	21	7 th sem-II CIE	19	7 th sem-III CIE	16	7 th sem vtU theory 5 th sem III CIE	20	
TUE	20		18		22		20		17	5 th sem III CIE	21	
WED	21		19		23		21		18	5 th sem III CIE	22	3 rd sem theory exam
THU	22		20		24		22		19		23	
FRI	23		21		25		23		20		24	
SAT	24	4 th Saturday holiday	22	4 th Saturday holiday	26	4 th Saturday holiday	24	4 th Saturday holiday	21		25	4 th Saturday holiday
SUN	25		23		27		25	Christmas	22		26	
MON	26		24	Naraka chaturdashi	28	3 rd sem-I CIE	26		23		27	
TUE	27		25		29		27		24		28	
WED	28		26	Balipadyami	30		28		25			
THU	29		27				29		26	Republic Day		
FRI	30		28				30		27	5 th sem LWD		
SAT			29				31	7 th sem LWD	28	4 th Saturday holiday		
SUN			30						29			
MON			31	START OF 3 rd SEMESTER					30	5 th sem exam - practical exam		
TUE			1/11	Rajyotsava					31			



CITY ENGINEERING COLLEGE

Department of CSE- ACADEMIC CALENDAR 2022-23 (Odd SEM)

DAY	SEPTEMBER 2022		OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEB 2023			
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT		
WED					2						1			
THU	1				3			1			2	3 rd sem –III CIE		
FRI	2				4			2			3			
SAT	3		1		5			3			4			
SUN	4		2		6			4			5			
MON	5		3		7			5		1 st Year Orientation	6			
TUE	6		4	Ayudha pooja	8			6			7	3 rd -II CIE 7 th sem vtU practical exam starts		
WED	7		5	Vijaya dashami	9			7			8			
THU	8		6		10			8		BOOTCAMP Workshop for 5 th Sem	9			
FRI	9		7		11	Kanakadasa Jayanthi		9			10			
SAT	10	2 nd Saturday holiday	8	2 nd Saturday holiday	12	2 nd Saturday holiday		10	2 nd Saturday holiday		11	3 rd Sem LWD 2 nd Saturday holiday		
SUN	11		9		13			11			12			
MON	12		10	START OF 5 th SEM / START OF I SEM	14	5 th I CIE		12	5 th sem II CIE		13	5 th sem theory exam 3 rd sem practical exam		
TUE	13		11		15			13			10		14	
WED	14		12		16			14			11		15	
THU	15		13		17			15			12		16	
FRI	16		14		18			16			17			
SAT	17		15		19			17			18			
SUN	18		16		20			18		2 nd Saturday holiday	19			
MON	19	START OF 7 th SEMESTER	17	7 th sem-I CIE	21	7 th sem-II CIE		19	7 th sem-III CIE		15	Makara Sankranti		
TUE	20		18		22		20			16		16	7 th sem vtU theory 5 th sem III CIE	20
WED	21		19		23		21			17		17	5 th sem III CIE	21
THU	22		20		24		22			18		18	5 th sem III CIE	22	3^{rd} sem theory exam
FRI	23		21		25	5 th Sem Orientation Guest Lecture for 3 rd and 5 th Sem		23		Hack-A-City CEC Hackathon	19	23		
SAT	24	4 th Saturday holiday	22	4 th Saturday holiday	26	4 th Saturday holiday		24	4 th Saturday holiday		20	24		
SUN	25		23		27			25	4 th Saturday holiday		21	25	4 th Saturday holiday	
MON	26		24	Naraka chaturdashi	28			26	4 th Saturday holiday		22	26		
TUE	27		25		29	3 rd sem-I CIE		27			23	27		
WED	28		26	Balipadyami	30				28			24	28	
THU	29		27						29			25	29	
FRI	30		28					30			26	30	Republic Day	
SAT			29					31			27	31	5 th sem LWD	
SUN			30								28	30	7 th sem LWD	
MON			31	START OF 3 rd SEMESTER							29	31	4 th Saturday holiday	
TUE			1	Rajyotsava							30	1	5 th sem exam –practical exam	

HOD



CITY ENGINEERING COLLEGE

Department Of CSE

Oct- Feb 2022-23

Time Table for III Sem A Section

Room: C-302

DAY	09:00- 10:00 AM	10:00 - 11:00 AM	11:15- 12:15 PM	12:15 - 01:15 PM	02:00 - 03:00 PM	03:00 - 04:00 PM	04:00 - 05:00 PM
MON	OOO(T)	DS	OOO LAB-A1/ ADE LAB -A2/ AE LAB A3		SCR	SK	REMEDIAL CLASS
TUE	ADE	MAT31	DS	CO	OOO LAB A2/ADE -A3/ AE LAB A1		
WED	MAT31	DS(T)	ADE	SK	CO		
THU	OOO(T)	DS	MAT31	CO	PHYSICAL EDUCATION		
FRI	DS(T)	ADE	OOO LAB -A3/ADE LAB-A1/ AE LAB A2		BK	BK	
SAT	MAT-DIP		NSS YOGA PE				

Sl. No	Course Code	Course Name	Course	Faculty Name
1	21MAT31	Transform Calculus, Fourier Series and Numerical Techniques	MAT31	Prof. Gayathri A
2	21CS32	Data Structure and Applications	DS	Prof. Laxmi M C
3	21CS33	Analog and Digital Electronics	ADE	Prof. Madhavi Kulkarni/ Prof. Punitha P (ADE LAB)
4	21CS34	Computer Organization and Architecture	CO	Dr. Mary Cherian
5	21CSL35	Object Oriented Programming with JAVA Laboratory	LAB	Prof. Archana Bhat/Prof. Shashikala H C
6	21SCR36	Social Connect and Responsibilities	SCR	Prof. Jayanth Katte
7	21KSK37/21KKBK37	Samskrutika Kannada/ Balake kannada	SK/BK	Prof. Deepa
9	21CSL381	Ability Enhancement Course - III Laboratory	AEL	Mr. Rakesh/Mr.Channabasappa/ Mrs. Shruthi V

Archana Bhat

Class Teacher: Prof. Archana Bhat

Archana Bhat
HOD

Shashikala H C
Principal



CITY ENGINEERING COLLEGE

Department Of CSE

Oct- Feb 2022-23

Time Table for III Sem B Section

Room: C-303

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	OOO(T)	MAT31		CO	ADE		OOO(T)	REMEDIAL CLASSES	
TUE	OOO LAB-B1/ ADE LAB -B2/ AE LAB B3			DS	ADE		PHYSICAL EDUCATION		
WED	MAT31	DS		OOO LAB-B2/ ADE LAB - B3/AE LAB B1			DS(T)		
THU	OOO LAB-B3/ ADE LAB -B1/ AE LAB B2			DS	CO		SCR	SK	SK
FRI	ADE	MAT31		CO	DS(T)		BK	BK	
SAT	MAT-DIP			NSS YOGA PE					

Sl. No	Course Code	Course Name	Course	Faculty Name
1	21MAT31	Transform Calculus, Fourier Series and Numerical Techniques	MAT31	Prof. Vanitha
2	21CS32	Data Structure and Applications	DS	Prof. Archana Bhat
3	21CS33	Analog and Digital Electronics	ADE	Prof. Gopikishan/ Prof. Punitha P (ADE LAB)
4	21CS34	Computer Organization and Architecture	CO	Prof. Shashikala H C
5	21CSL35	Object Oriented Programming with JAVA Laboratory	LAB	Prof. Shruti Vijay/ Prof. Archana Bhat
6	21SCR36	Social connect and Responsibility	SCR	Mr. Jayanth Katte
7	21KSK37/21KBK37	Samskrutika Kannada/Balake kannada	SK	Prof. Deepa
9	21CSL381	Ability Enhancement Course – III Laboratory	AEL	Mr. Rakesh/Mr.Channabasappa/ Mr. Gangappa

Class Teacher: Prof. Shashikala H C

HOD

Principal



CITY ENGINEERING COLLEGE

Department Of CSE

Oct- Feb 2022-23

Time Table for III Sem C Section

Room: C-304

DAY	09:00- 10:00 AM	10:00 - 11:00 AM		11:15- 12:15 PM	12:15 - 01:15 PM		02:00 - 03:00 PM	03:00 - 04:00 PM	04:00 - 05:00 PM	
MON	MAT31	ADE	SHORT BREAK	CO	DS(T)	LUNCH BREAK	OOC LAB -C1/ADE LAB -C2/ AE LAB C3		REMEDIAL CLASS	
TUE	DS	SK		OOC LAB -C2/ ADE LAB -C3/AE LAB C1						
WED	OOC(T)	ADE		CO	DS(T)		SCR			
THU	ADE	MAT31		SK	DS		OOC LAB -C3/ADE LAB -C2/AE LAB C2			
FRI	MAT31	OOC(T)		CO	DS		BK	BK		
SAT	MAT -DIP			PHYSICAL EDUCATION						

Sl. No	Course Code	Course Name	Course	Faculty Name
1	21MAT31	Transform Calculus, Fourier Series and Numerical Techniques	MAT31	Prof. Gayathri A
2	21CS32	Data Structure and Applications	DS	Prof. Laxmi M C
3	21CS33	Analog and Digital Electronics	ADE	Prof. Madavi Kulkarni/Mrs. Punitha P (ADE LAB)
4	21CS34	Computer Organization and Architecture	CO	Dr. Mary Cherian
5	21CSL35	Object Oriented Programming with JAVA Laboratory	OOC LAB	Prof. Shashikala/ Prof. Vinod Kumar
6	21SCR36	Social Connect and Responsibilities	SCR	Mr. Jayanth Katte
7	21KSK37	Sanskrutika Kannada	SK	Prof. Deepa
9	21CSL381	Ability Enhancement Course - III Laboratory	AEL	Prof. Vindhya/ Mr. Rakesh/Mr.Channabasappa

Class Teacher: Prof. Laxmi M C

HOD

Principal



CITY ENGINEERING COLLEGE

Department Of CSE

FEB - APR 2023

Time Table for III Sem Diploma

Room: C-203

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	CO	MAT31		SK			DS	DS LAB	
TUE	DS	AE LAB		AE LAB			PHYSICAL EDUCATION		
WED	MAT31	SK		CO	DS		ADE LAB		
THU	CO	OOO(T)		ADE	ADE				
FRI	ADE	MAT31		SCR			OOO LAB		
SAT	MAT-DIP								

Sl . No	Course Code	Course Name	Course	Faculty Name
1	21MAT31	Transform Calculus, Fourier Series and Numerical Techniques	MAT31	Prof. Vanitha
2	21CS32	Data Structure and Applications	DS	Prof. Archana Bhat
3	21CS33	Analog and Digital Electronics	ADE	Prof. Gopikishan
4	21CS34	Computer Organization and Architecture	CO	Prof. Shashikala H C
5	21CSL35	Object Oriented Programming with JAVA Laboratory	LAB	Prof. Shruti Vijay
6	21SCR36	Social connect and Responsibility	SCR	Mr. Manjunath
7	21KSK37/21KKBK37	Samskrutika Kannada/Balake kannada	SK	Prof. Deepa
9	21CSL381	Ability Enhancement Course – III Laboratory	AEL	Mr. Vinod Kumar

Class Teacher: Prof. Shashikala H C

HOD

Principal



CITY ENGINEERING COLLEGE

Department Of CSE

Oct- Jan 2023

Time Table for V Sem A Section

Room: C-201

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	UNIX	CNS	SHORT BREAK	DBMS	ADP	LUNCH BREAK	A1- CNS LAB/A2 -DBMS LAB		
TUE	CNS	UNIX		ATC	DBMS		UNIX	CNS(T)	ES
WED	ME	ADP		DBMS(T)	ATC		CNS(T)	ME(T)	ME(T)
THU	ATC	ME		ADP	DBMS		A1- DBMS LAB/ A2- CNS LAB		
FRI	DBMS	CNS		DBMS(T)	DBMS(T)		CNS(T)	CNS(T)	
SAT	REMEDIAL CLASSES								

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS51	Management, Entrepreneurship for IT Industry	ME	Dr. Nandakumar A N
2	18CS52	Computer Networks and Security	CNS	Mrs. Sangeetha Rao S
3	18CS53	Database Management System	DBMS	Mr. Nandish A.C
4	18CS54	Automata Theory and Computability	ATC	Mrs. Tejaswini B N
5	18CS55	Application Development Using Python	ADP	Dr. Jagannath
6	18CS56	Unix Programming	UNIX	Mrs. Sangeetha U
7	18CSL57	Computer Network Laboratory	CN LAB	Mrs. Sangeetha Rao S/ Mrs. Sangeeta Uranakar/ Ms. Jamuna B S
8	18CSL58	DBMS Laboratory	DBMS LAB	Ms. Nandish A. C/ Mr. Girish G A/ Mrs. Tejaswini B N
9	18CIV59	Environmental Studies	ES	Mr. Jayanth Katte

Class Teacher: Mrs. Sangeetha Rao S

HOD

Principal



CITY ENGINEERING COLLEGE

Department Of CSE

Oct- Jan 2023

Time Table for V Sem B Section

Room: C-202

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	DBMS	ADP	SHORT BREAK	ATC	CNS(T)	LUNCH BREAK	DBMS(T)	DBMS(T)	
TUE	ATC	DBMS		ADP	CNS		B2-CNS LAB/B1-DBMS LAB		
WED	UNIX	ATC		CNS	ADP		B1 -CNS LAB/B2 -DBMS LAB		
THU	CNS	DBMS		CNS(T)	UNIX		ME	ES	DBMS(T)
FRI	ME	UNIX		DBMS(T)	CNS(T)		ME(T)	ME(T)	
SAT	REMEDIAL CLASSES								

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS51	Management, Entrepreneurship for IT Industry	ME	Dr. Nandakumar A N
2	18CS52	Computer Networks and Security	CNS	Mrs. Sangeetha Rao S
3	18CS53	Database Management System	DBMS	Mr. Nandish A.C
4	18CS54	Automata Theory and Computability	ATC	Mrs. Tejaswini B N
5	18CS55	Application Development Using Python	ADP	Dr. Jagannath
6	18CS56	Unix Programming	UNIX	Mrs. Sangeetha U
7	18CSL57	Computer Network Laboratory	CN LAB	Mrs. Sangeetha Rao S/ Mrs. Sangeeta Uranakar/Ms. Jamuna B S
8	18CSL58	DBMS Laboratory	DBMS LAB	Ms. Nandish A. C/ Mr. Girish G A/ Mrs. Tejaswini B N
9	18CIV59	Environmental Studies	ES	Mr. Jayanth Katte

Class Teacher: Mrs. Tejaswini B N

HOD

Principal



CITY ENGINEERING COLLEGE

Department Of CSE

Sept- Dec 2022-23

Time Table for VII Sem A Section

Room: C-303

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15– 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	BDA	E&E	Short Break	AI/ML	NM	Lunch Break	Project Work		
TUE	AI/ML	NM		UID	BDA		AI/ ML LAB (A1 Batch)		
WED	NM	BDA		AI/ML	E&E		Project Work		
THU	AI/ ML LAB (A2 Batch)				UID		Internship / Seminar		
FRI	E&E	UID		BDA	AI/ML		Placement Activities		
SAT	Placement Activities			Placement Activities					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS71	Artificial Intelligence and Machine Learning	AI&ML	Mrs. Ambika P R
2	18CS72	Big Data Analytics	BDA	Mr. Girish G A
3	18CS734	User Interface Design	UID	Mr. Vinod Kumar
4	18CS742	Network Management	NM	Mrs. Shruthi Vjay
5	18ME751	Energy and Environment (Open Elective)	E&E	Dr. Y.S Kumaraswamy
6	18CSL76	Artificial Intelligence and Machine Learning Laboratory	AI&ML LAB	Mrs. Ambika P R/Mrs. Laxmi M C
7	18CSP77	Project Work Phase I	Project	Mr. Nandish A.C/ Mrs. Ambika P.R
8	-	Internship	INT	Dr. Nandakumar A N
9	-	AICTE Activity		Mrs. Laxmi M.C/Mrs. Shruthi Vijay

Class Teacher: Mr. Girish G A

HOD

Principal



CITY ENGINEERING COLLEGE

Department Of CSE

Sept- Dec 2022-23

Time Table for VII Sem B Section

Room: C-304

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15– 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	UID	AI/ML	Short Break	BDA	E&E	Lunch Break	AI/ ML LAB (B1 Batch)		
TUE	BDA	E&E		AI/ML	NM		Project Work		
WED	AI/ML	UID		NM	BDA		Internship/ Seminar		
THU	E&E	UID		BDA	AI/ML		Project Work		
FRI	AI/ ML LAB (B2 Batch)				NM		Placement Activities		
SAT	Placement Activities			Placement Activities					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS71	Artificial Intelligence and Machine Learning	AI&ML	Mrs. Ambika P-R
2	18CS72	Big Data Analytics	BDA	Mr. Girish G A
3	18CS734	User Interface Design	UID	Mr. Vinod Kumar
4	18CS742	Network Management	NM	Mrs. Shruthi Vjay
5	18ME751	Energy and Environment (Open Elective)	E&E	Dr. Y.S Kumaraswamy
6	18CSL76	Artificial Intelligence and Machine Learning Laboratory	AI&ML LAB	Mrs. Ambika P R/Mrs. Laxmi M C
7	18CSP77	Project Work Phase I	Project	Mr. Nandish A.C/ Mrs. Ambika P.R
8	-	Internship	INT	Dr. Nandakumar A N
9	-	AICTE Activity		Mrs. Laxmi M.C/Mrs. Shruthi Vijay

Class Teacher: Mrs. Shruthi Vijay

HOD

Principal



CITY ENGINEERING COLLEGE

Department Of CSE

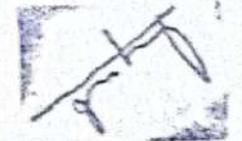
Oct- Feb 2022-2023

Individual Time Table VII A&B

Faculty Name: Prof. Shruthi Vijay

Subject: Network Management, AE Lab, OOC Lab

DAY	09:00- 10:00 AM	10:00 - 11:00 AM		11:15- 12:15 PM	12:15 - 01:15 PM		02:00 - 03:00 PM	03:00 - 04:00 PM	04:00 - 05:00 PM
MON	OOO(T)			AE LAB A3	A (Nm)		OOO(T)		
TUE	OOO LAB B1	A (Nm)			(Nm) B		AE LAB A1		
WED	A (Nm)			B (Nm)	OOO LAB B2				
THU	OOO LAB B3								
FRI				AE LAB A2	B (Nm)				
SAT									



HOD

HOD

Dept of Computer Science & Engineering
CITY ENGINEERING COLLEGE
Doddakallasandra / Chikkaballapura Road
Bangalore 560061

NETWORK MANAGEMENT (Effective from the academic year 2018 -2019) SEMESTER – VII			
Course Code	18CS742	CIE Marks	40
Number of Contact Hours/Week	3:0:0	SEE Marks	60
Total Number of Contact Hours	40	Exam Hours	03
CREDITS –3			
Course Learning Objectives: This course (18CS742) will enable students to:			
<ul style="list-style-type: none"> • Illustrate the need for interoperable network management. • Explain the concepts and architecture behind standards based network management. • Differentiate the concepts and terminology associated with SNMP and TMN • Describe network management as a typical distributed application 			
Module 1			Contact Hours
Introduction: Analogy of Telephone Network Management. Data and Telecommunication Network Distributed computing Environments, TCP/IP-Based Networks: The Internet and Intranets. Communications Protocols and Standards- Communication Architectures. Protocol Layers and Services; Case Histories of Networking and Management – The Importance of topology . Filtering Does Not Reduce Load on Node. Some Common Network Problems; Challenges of Information Technology Managers. Network Management: Goals, Organization, and Functions- Goal of Network Management, Network Provisioning, Network Operations and the NOC, Network Installation and Maintenance; Network and System Management, Network Management System platform, Current Status and Future of Network Management. Textbook 1: Ch.1 RBT: L1, L2			08
Module 2			
Basic Foundations: Standards, Models, and Language: Network Management Standards, Network Management Model, Organization Model, Information Model – Management Information Trees. Managed Object Perspectives. Communication Model: ASN.1- Terminology, Symbols, and Conventions, Objects and Data Types, Object Names, An Example of ASN.1 from ISO 8824; Encoding Structure: Macros. Functional Model. Textbook 1: Ch.3 RBT: L1, L2			08
Module 3			
SNMPv1 Network Management: Managed Network: The History of SNMP Management, Internet Organizations and standards, Internet Documents, The SNMP Model, The Organization Model, System Overview, The Information Model – Introduction, The Structure of Management Information, Managed Objects, Management Information Base, The SNMP Communication Model – The SNMP Architecture, Administrative Model, SNMP Specifications, SNMP Operations, SNMP MIB Group, Functional Model SNMP Management – RMON: Remote Monitoring, RMON SMI and MIB, RMON1- RMON1 Textual Conventions, RMON1 Groups and Functions, Relationship Between Control and Data Tables, RMON1 Common and Ethernet Groups, RMON Token Ring Extension Groups, RMON2 – The RMON2 Management Information Base, RMON2 Conformance Specifications. Textbook 1: Ch. 4,5, Ch.8 RBT: L1, L2			08
Module 4			

<p>Broadband Access Networks, Broadband Access Technology; HFCT Technology: The Broadband LAN. The Cable Modem. The Cable Modem Termination System. The HFC Plant. The RF Spectrum for Cable Modem; Data Over Cable. Reference Architecture; HFC Management – Cable Modem and CMTS Management, HFC Link Management, RF Spectrum Management, DSL Technology; Asymmetric Digital Subscriber Line Technology – Role of the ADSL Access Network in an Overall Network, ADSL Architecture, ADSL Channeling Schemes, ADSL Encoding Schemes; ADSL Management – ADSL Network Management Elements, ADSL Configuration Management, ADSL Fault Management, ADSL Performance Management, SNMP-Based ADSL Line MIB, MIB Integration with Interfaces Groups in MIB-2, ADSL Configuration Profiles</p> <p>Textbook 1: Ch. 13 RBT: L1, L2</p>	08
Module 5	
<p>Network Management Applications: Configuration Management- Network Provisioning, Inventory Management, Network Topology, Fault Management- Fault Detection, Fault Location and Isolation 24 Techniques, Performance Management – Performance Metrics, Data Monitoring, Problem Isolation, Performance Statistics; Event Correlation Techniques – Rule-Based Reasoning, Model-Based Reasoning, CaseBased Reasoning, Codebook correlation Model, State Transition Graph Model, Finite State Machine Model, Security Management – Policies and Procedures, Security Breaches and the Resources Needed to Prevent Them, Firewalls, Cryptography, Authentication and Authorization, Client/Server Authentication Systems, Messages Transfer Security, Protection of Networks from Virus Attacks, Accounting Management, Report Management, Policy- Based Management, Service Level Management.</p> <p>Textbook 1: Ch.11 RBT: L1, L2</p>	08
Course Outcomes: The student will be able to :	
<ul style="list-style-type: none"> • Analyze the issues and challenges pertaining to management of emerging network technologies such as wired/wireless networks and high-speed internets. • Apply network management standards to manage practical networks • Formulate possible approaches for managing OSI network model. • Use on SNMP for managing the network • Use RMON for monitoring the behavior.of the network • Identify the various components of network and formulate the scheme for the managing them 	
Question Paper Pattern:	
<ul style="list-style-type: none"> • The question paper will have ten questions. • Each full Question consisting of 20 marks • There will be 2 full questions (with a maximum of four sub questions) from each module. • Each full question will have sub questions covering all the topics under a module. • The students will have to answer 5 full questions, selecting one full question from each module. 	
Textbooks:	
<ol style="list-style-type: none"> 1. Mani Subramanian: Network Management- Principles and Practice, 2nd Pearson Education, 2010. 	
Reference Books:	
<ol style="list-style-type: none"> 1. J. Richard Burke: Network management Concepts and Practices: a Hands-On Approach, PHI, 2008. 	



DEPARTMENT OF CSE

LESSON PLAN FOR ODD SEMESTER FOR ACADEMIC YEAR 2021 - 2022

Course Title: Network Management	Course Code: 18CS742
Total contact hours: 3:0:0	End Term Marks :60
Internal Marks: 40	
Semester: VII sem A & B section	Academic year: 2020-2021
Lesson plan Author: Shruthi Vijay	Date: 01-10-2021

Course Learning Objectives:

This course (18CS742) will enable students to:

1. Illustrate the need for interoperable network management.
2. Explain the concepts and architecture behind standards-based network management.
3. Differentiate the concepts and terminology associated with SNMP and TMN
4. Describe network management as a typical distributed application

Course Outcomes:

The student will be able to:

1. Analyze the issues and challenges pertaining to management of emerging network technologies such as wired/wireless networks and high-speed internets.
2. Apply network management standards to manage practical networks
3. Formulate possible approaches for managing OSI network model.
4. Use on SNMP for managing the network
5. Use RMON for monitoring the behavior of the network
6. Identify the various components of network and formulate the scheme for the managing them

Module 1

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	Introduction: Analogy of Telephone Network Management, Data and Telecommunication Network Distributed Computing Environments, TCP/IP-Based Networks: The Internet and Intranets, Communications Protocols and Standards- Communication Architectures, Protocol Layers and Services	L1, L2	CO1, CO2
2	Case Histories of Networking and Management – The Importance of topology, Filtering Does Not Reduce Load on Node, Some Common Network Problems; Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions- Goal of Network Management, Network Provisioning.	L1, L2	

3	Network Operations and the NOC, Network Installation and Maintenance; Network and System Management, Network Management System platform, Current Status and Future of Network Management, Basic Foundations: Standards, Models, and Language: Network Management Standards	L1, L2	
---	--	--------	--

Module 2

Week	Contents of Module -2	Bloom's Taxonomy Level	Course Outcome (CO)
4	Network Management Model, Organization Model, Information Model – Management Information Trees, Managed Object Perspectives, Communication Model	L1, L2	CO3, CO4
5	ASN.1- Terminology, Symbols, and Conventions, Objects and Data Types, Object Names, An Example of ASN.1 from ISO 8824; Encoding Structure; Macros, Functional Model.	L1, L2, L3	
6	SNMPv1 Network Management: Managed Network: The History of SNMP Management, Internet Organizations and standards, Internet Documents, The SNMP Model, The Organization Model, System Overview.	L1, L2	

Module 3

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
7	The Information Model – Introduction, The Structure of Management Information, Managed Objects, Management Information Base. The SNMP Communication Model – The SNMP Architecture, Administrative Model, SNMP Specifications, SNMP Operations, SNMP MIB Group	L1, L2	CO4, CO5
8	Functional Model SNMP Management – RMON: Remote Monitoring, RMON SMI and MIB, RMON1- RMON1 Textual Conventions, RMON1 Groups and Functions, Relationship Between Control and Data Tables, RMON1 Common and Ethernet Groups, RMON Token Ring Extension Groups, RMON2 – The RMON2 Management Information Base, RMON2 Conformance Specifications.	L1, L2	
9	Broadband Access Networks, Broadband Access Technology: HFCT Technology: The Broadband LAN, The Cable Modem, The Cable Modem Termination System, The HFC Plant, The RF Spectrum for Cable Modem; Data Over Cable, Reference Architecture; HFC Management – Cable Modem and CMTS Management	L1, L2	

Module 4

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
10	HFC Link Management, RF Spectrum Management, DSL Technology; Asymmetric Digital Subscriber Line Technology – Role of the ADSL-Access Network in an Overall Network, ADSL Architecture, ADSL Channeling Schemes, ADSL Encoding Schemes; ADSL Management – ADSL Network Management Elements	L1, L2	
11	ADSL Configuration Management, ADSL Fault Management, ADSL Performance Management, SNMP-Based ADSL Line MIB, MIB Integration with Interfaces Groups in MIB-2, ADSL Configuration Profiles	L1, L2	
12	Network Management Applications: Configuration Management- Network Provisioning, Inventory Management, Network Topology, Fault Management- Fault Detection, Fault Location, and Isolation 24 Techniques	L1, L2	

Module 5

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
13	Performance Management – Performance Metrics, Data Monitoring, Problem Isolation, Performance Statistics; Event Correlation Techniques – Rule-Based Reasoning, Model-Based Reasoning, Case Based Reasoning, Codebook correlation Model, State Transition Graph Model, Finite State Machine Model	L1, L2	CO6
14	Security Management – Policies and Procedures, Security Breaches and the Resources Needed to Prevent Them, Firewalls, Cryptography, Authentication and Authorization, Client/Server Authentication Systems, Messages Transfer Security, Protection of Networks from Virus Attacks, Accounting Management, Report Management, Policy- Based Management, Service Level Management.	L1, L2	

RBT Level

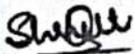
L1-Remembering L2-Understanding L3-Appling L4-Analysing L5-Evaluating L6-Creating

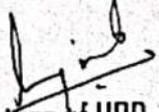
Textbooks:

Mani Subramanian: Network Management- Principles and Practice, 2nd Pearson Education, 2010.

Reference Books:

J. Richard Burke: Network management Concepts and Practices: a Hands-On Approach, PHI, 2008.


Signature of Faculty


Signature of HOD

CITY ENGINEERING COLLEGE

Department of CSE

VII SEM 'A'

SEPT - 2022

SL. NO	USN	NAME OF THE STUDENT
1	1CE19CS001	AAKASH T E
2	1CE19CS002	ACHYUTH MAHESH HEGDE
3	1CE19CS003	AFRID PASHA H P
4	1CE19CS004	AISHWARYA B M
5	1CE19CS005	AISHWARYA C
6	1CE19CS007	AMITH SINGH M
7	1CE19CS008	ANANYA BHOMBORE
8	1CE19CS009	APOORVA R SHET
9	1CE19CS010	ARSHAD ULLA Z
10	1CE19CS012	ASHWINI B
11	1CE19CS013	B M PUNEETH
12	1CE19CS014	BHANU PRAKASH R
13	1CE19CS015	BHAVANA S
14	1CE19CS016	BHOLAY NATH SINGH
15	1CE19CS017	BINDHUSHREE G
16	1CE19CS018	CHANDAN KUMAR C
17	1CE19CS019	CHANDANA D Y
18	1CE19CS020	CHANDINI R P
19	1CE19CS021	CHARANSIMHA D
20	1CE19CS022	CHETAN S
21	1CE19CS023	CHETHAN R
22	1CE19CS024	CHETHANRAJ H
23	1CE19CS025	CHIRANJEEVI V
24	1CE19CS026	DARSHAN K
25	1CE19CS027	DEEPAK JADON
26	1CE19CS028	DEEPTHY RASHMI R
27	1CE19CS030	DIVYA S A
28	1CE19CS031	FOZAIL AHMED

A1

SL. NO	USN	NAME OF THE STUDENT
29	1CE19CS032	GEETHANSH P
30	1CE19CS033	HARISH BABU K P
31	1CE19CS034	HARSHITH G R
32	1CE19CS035	HEMANTH V
33	1CE19CS037	IQRA FATHIMA
34	1CE19CS038	JAANESHWAR DA
35	1CE19CS039	JEEVAN M
36	1CE19CS040	JYOTHI SHREE S R
37	1CE19CS041	KAVANA B
38	1CE19CS042	KEERTHI CHANDRA N L
39	1CE19CS043	KEERTHI KUMARI
40	1CE19CS044	KISHAN GOWDA
41	1CE19CS045	KRITHIKA N KOUSHIK
42	1CE19CS046	KRUTTIKA KIRANKUMAR BHOMKAR
43	1CE19CS047	MANASA R
44	1CE19CS048	MANOHAR M
45	1CE19CS049	MANOJ M K
46	1CE19CS050	MANOJ R
47	1CE19CS051	MARIA MONICA P
48	1CE19CS052	MOHAMMED UZAIR BAIG
49	1CE19CS056	MRUDULA S PRASAD
50	1CE19CS058	NISHANTH NAYAKA N R
51	1CE19CS059	NITHIN RAJ GOWDA
52	1CE19CS076	SAIMA SHEIK
53	1CE19CS081	SHANKARLINGA M MATTIMANI
54	1CE19CS085	SPOORTHI H M
55	1CE19CS092	SYED MUTAIB ULLA
56	1CE19CS103	X SEMANTHA MERCY

A2


HOD

18CS742 Network Management System

Question Bank

Module -1

1. Explain Telephone Network Model with neat Diagram.
2. Explain :
 - a) Data Transmission
 - b) Simple Client Server Model
3. Explain IBM System Network Architecture Model
4. Explain Client Server Model in distributed computing environment
5. Explain Internet & Intranet Models.
6. Explain basic communication architecture with a diagram
7. Explain OSI communication architecture model.
8. a) Explain network layer with neat diagram
b) Explain data link layer with neat diagram
9. Explain challenges of information technology managers.
10. Explain network management functions with a neat diagram.
11. Discuss different case histories of networking and management
12. Explain goals of network management.
13. Briefly illustrate Network management Dumbbell architecture.
14. Explain Internet and Intranet Models in detail.(TCP/IP based networks).
15. Discuss PDU communication model between end systems
16. Explain Network operations & NOC in detail.

Question Bank

Module -2

1. Explain Network management Standards.
2. Explain Organizational Model with neat diagram.
3. Explain Information Model in detail.
4. Describe Management Information tree in detail.
5. Explain conceptual views of Managed object with suitable example (Packet Counter).
6. Explain Communication Model with neat diagram.
7. Explain ASN.1 terminology symbols and conventions.
8. Discuss ASN.1 Objects and datatypes with a neat diagram.
9. Discuss an example of ASN.1 from ISO 8824.
10. Explain Encoding Structure in detail with an example (TLV Encoding Structure).
11. Encode '0C1B' using TLV encoding Structure.
12. What are Macros? Describe the structure of ASN.1 Macro with an example
13. Explain Functional Model in detail.

Question Bank

Module - 3

1. What is remote monitoring? Explain RMON architecture briefly?
2. Explain SNMP organization model with a neat diagram.
3. Explain SNMP Information model with a neat diagram.
4. Discuss SNMP communication model.
5. Explain SNMP administrative model with a neat diagram.
6. Explain with a neat diagram the SNMP architecture.
7. Write short notes on:
 - MIB
 - SNMP functional model
8. What is the SNMP community? Explain SNMP Community profile and Access policy.
9. What is Remote Monitoring (RMON)? With a figure explain RMON probe.
10. Explain relationships between control and data tables.
11. Explain RMON token extension groups?
12. Explain RMON1 groups and functions.
13. Explain RMON 2 architecture with a neat diagram?
14. Discuss RMON2 MIB and Conformance specifications.

Question Bank

Module - 4

1. Explain HFCT technology with a neat diagram?
2. Explain RF spectrum architecture with a neat diagram?
3. What is DSL technology? Explain briefly?
4. Discuss HFC link and RF spectrum management
5. Explain role of ADSL access network.
6. Discuss ADSL architecture with neat diagram
7. Explain ADSL channeling schemes
8. Explain in detail ADSL Encoding schemes.
9. Discuss the following:
 - ADSL configuration management
 - ADSL Fault management
 - ADSL Performance management
10. Discuss ADSL configuration profiles.

Question Bank

Module - 5

1. Explain Network Management:
 - Performance matrix
 - Data monitoring
 - Problem isolation
 - Performance statistics
2. Explain Network Security Management briefly:
 - Policies and procedures
 - Firewalls
 - Cryptography
 - Authentication and Authorisation
 - Client Server Authentication Systems
 - Messages Transfer Security
3. Discuss in detail configuration management.
4. Explain fault management
5. Discuss 24 techniques for fault location and isolation
6. Explain performance management
7. Discuss various event correlation techniques
8. Describe finite state machine model
9. Explain how to protect network from virus attacks

NMS Assignment -1

1. Discuss the network management functional groupings with neat diagram.
2. Define data and Telecommunication network. Illustrate IBM System network architecture model?
3. Illustrate OSI Communication architecture.
4. What are the challenges of IT managers in managing the network?
5. Discuss client server model in Distributed computing environment.
6. Briefly illustrate network management Dumbbell Architecture.
7. Explain Telephone Network Model with neat Diagram.
8. Explain Network Layer in detail.
9. Explain Data link Layer with neat diagram.
10. Discuss case histories of Networking and Management.
 - (a) The Importance of Topology ("The case of Footprint")
 - (b) Case of crashing Bridge
11. Explain Internet and Intranet Models in detail (TCP/IP based Networks).
12. Explain Basic Communication architecture with neat diagram.
13. Explain Network Management goals in detail.
14. Discuss PDU communication model between End systems.
15. Explain Network operations & NOC in detail.

Network Management Quiz-1

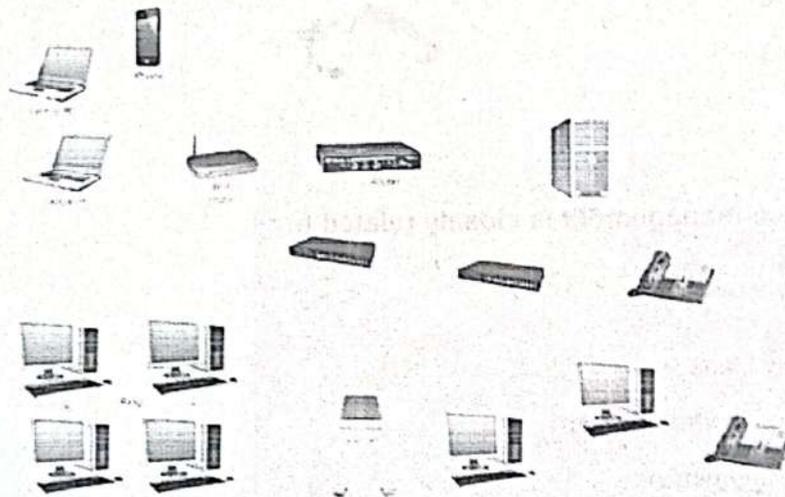
* Required

1. NAME: *

2. USN *

3. Identify the type of computer network *

1 point



Mark only one oval.

- LAN
- WAN
- MAN
- PAN

4. Length of IP address *

1 point

Mark only one oval.

- 32 bits
- 64 bits
- 128 bits
- 8 bits

5. Complex networks today are made up of hundreds and sometimes thousands of *

* 1 point

Mark only one oval.

- Documents
- Components
- Servers
- Entities

6. Performance management is closely related to *

1 point

Mark only one oval.

- Security Management
- Accounting Management
- Fault Management
- Configuration Management

7. The process of making a copy of data and storing elsewhere, in case the original is lost is called * 1 point

Mark only one oval.

- Virus Checker
- Firewall
- Back-up
- Recovery

8. In which process data is jumbled using a key so that it is not in a readable format * 1 point

Mark only one oval.

- Encryption
- Decryption
- Cryptography
- Block chain

9. TCP is which layer protocol * 1 point

Mark only one oval.

- Physical Layer
- Data Link Layer
- Network Layer
- Transport Layer

10. Which group is responsible for fixing up of troubles in network * 1 point

Mark only one oval.

- Engineering group
- Operations group
- Installation and maintenance group
- Management group

11. Purpose of Network Management system is to achieve * 1 point

Mark only one oval.

- Efficiency
- Minimum cost
- Reduced delay
- All of the above

12. Which protocol is responsible for transmitting e-mail messages * 1 point

Mark only one oval.

- SMTP
- SNMP
- HTTP
- FTP

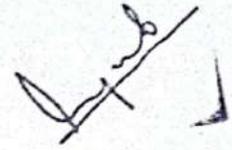
This content is neither created nor endorsed by Google

Google Forms

NETWORK MANAGEMENT QUIZ - I

NAME:	USN	Score	Reduced to 5M
Anisha sampanna	1ce18cs007	10 / 10	5
Kavana Sagar .H	1CE18CS032	9 / 10	5
Lakshmeesh D	1CE18CS038	8 / 10	4
MEZY SANDRA DSOUZ	1ce18cs043	9 / 10	5
Niranjan M	1ce18cs051	9 / 10	5
Rahulkumar	1ce18cs063	10 / 10	5
SAHANA R	1CE18CS066	9 / 10	5
Shraavya S	1CE18CS074	10 / 10	5
Shreyas BS Gowda	1CE18CS076	10 / 10	5
Shreyas v	1ce18cs077	10 / 10	5
Ullas	1ce18cs091	0 / 10	0
Varsha H	1CE18CS096	8 / 10	4
Aakash T E	1CE19CS001	10 / 10	5
Achyuth Mahesh Hegde	1CE19CS002	10 / 10	5
AFRID PASHA HP	1CE19CS003	9 / 10	5
Aishwarya BM	1CE19CS004	9 / 10	5
Aishwarya C	1CE19CS005	10 / 10	5
AMIR REHAN	1ce19cs006	10 / 10	5
Amith Singh.M	1CE19CS007	10 / 10	5
Ananya Bhombore	1CE19CS008	10 / 10	5
Apoorva r shet	1ce19cs009	10 / 10	5
Arshad Ulla Z	1CE19CS010	10 / 10	5
Artee Kumari R	1CE19CS011	10 / 10	5
Ashwini B	1CE19CS012	8 / 10	4
B. M. Puneeth	1CE19CS013	10 / 10	5
BHANU PRAKASH R	1CE19CS014	10 / 10	5
BHAVANA S	1CE19CS015	9 / 10	5
Bholay Nath Singh	1CE19CS016	10 / 10	5
Bindhushree G	1ce19cs017	10 / 10	5
Chandan Kumar C	1CE19CS018	10 / 10	5
Chandana D Y	1ce19cs019	7 / 10	4
Chandini R P	1CE19CS020	10 / 10	5
Charan Simha D	1CE19CS021	9 / 10	5
Chetan S	1CE19CS022	9 / 10	5
Chethan R	1ce19cs023	0 / 10	0
CHETHAN RAJ H	1CE19CS024	9 / 10	5
Chiranjeevi v	1CE19CS025	8 / 10	4
Darshan K	1ce19cs026	10 / 10	5
Deepak	1ce19cs027	9 / 10	5
Deepthy Rashmi R	1CE19CS028	9 / 10	5
Divya S A	1ce19cs030	10 / 10	5
Fozail Ahmed	1CE19CS031	10 / 10	5
Geethansh P	1CE19CS032	9 / 10	5
Harish Babu KP	1CE19CS033	9 / 10	5
Harshith gr	1ce19cs034	9 / 10	5

CITY
ENGINEERING COLLEGE
Kanakapura Road, Doddakallasandra, Bengaluru - 560062
FIRST INTERNAL TEST



Programme : Computer Science & Engineering
Course Name: Network Management
Semester : VII
Duration : 1 ½Hrs

Date: 28/10/2022
Time: 2:30 - 4:00 PM
MAX MARKS: 50

Note: Answer any FIVE questions choosing at least ONE from each Part.

CO'S	BT'S
------	------

Part - A

1.	Explain Telephonic Network Model with neat Diagram	10	CO1	BT1,2
----	--	----	-----	-------

Or

2.	Explain Client -Server Model in Distributed Environment	10	CO1	BT1,2
----	---	----	-----	-------

Part - B

3.	Explain OSI Communication Architecture Model with neat diagram	10	CO1	BT1,2
----	--	----	-----	-------

Or

4.	Discuss the network management functional groupings with neat diagram.	10	CO1	BT1,2
----	--	----	-----	-------

Part-C

5.	Explain Internet and Intranet Models in detail	10	CO1	BT1,2
----	--	----	-----	-------

Or

6.	Briefly illustrate network management Durabell Architecture	10	CO1	BT1,2
----	---	----	-----	-------

Part-D

7.	Explain IBM System architecture Model	10	CO1	BT1,2
----	---------------------------------------	----	-----	-------

Or

8.	What are the challenges of IT managers in managing the network	10	CO1	BT1,2
----	--	----	-----	-------

Part-E

9.	Explain Network Management goals in detail	10	CO1	BT1,2
----	--	----	-----	-------

Or

10	Illustrate organization model in detail with a neat diagram	10	CO2	BT1,2
----	---	----	-----	-------

Blooms Taxonomy Levels (BTL): BT1-Remembering BT2- Understanding BT3-Applying BT4-Analysing

Course Outcomes (CO's): After studying this course, students will be able to;

CO1: Analyze the issues and challenges pertaining to management of emerging network and technologies such as wired/wireless networks and high speed internets.

CO2: Apply network management standards to manage practical networks.

CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SCHEME FOR EVALUATION

CIE TEST I

SEMESTER & SECTION: VII - A, B

DATE: 28/10/2022

Q. No	Details of the Answer	Marks Distribution	Total marks
1)	<p style="text-align: center;">TELEPHONE NETWORK MODEL .</p>	5M	10M
	<p>→ Telephone network characteristics - Reliable, Dependable, Quality & Speed.</p> <p>→ Architecture is hierarchical, 5 levels of switches & 3 types of trunks that connect switches: Trunk - logical link between 2 switches. End offices (class 5) - local switching office.</p> <p>→ customer telephone which is switch is connected to end office via dedicated line called loop. 5M</p> <p>→ DDD (Direct distance dialing) - enables us to dial far-end telephone without operator assistance</p> <ul style="list-style-type: none"> * Direct trunk: connects 2 end offices. * Toll connecting trunk: end office to any toll office. * Toll (internal) trunk: connects any 2 toll offices. 		

Staff Signature: *[Signature]*

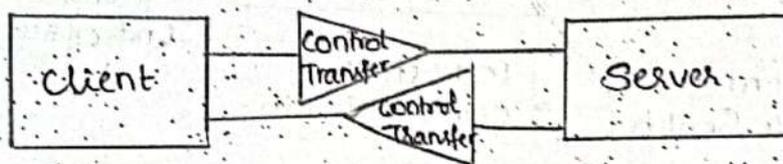
[Signature]

Q. No	Details of the Answer	Marks Distribution	Total marks
	<ul style="list-style-type: none"> → Primary & Secondary routes are already programmed into switch. If primary is broken alternative route is automatically assigned. → Operations support systems ensure SOS in telephone network. Quality of call is measured in terms of S/N ratio. → NOC (Network operation center) where global status of network is monitored - nerve center of telephone network. 		

2) CLIENT-SERVER MODEL IN DISTRIBUTED ENVIRONMENT.

Client: The process that initiates a transaction to run an application in either local or remote processor.

Server: The process that is invoked by a client is called server. Server returns result to client.

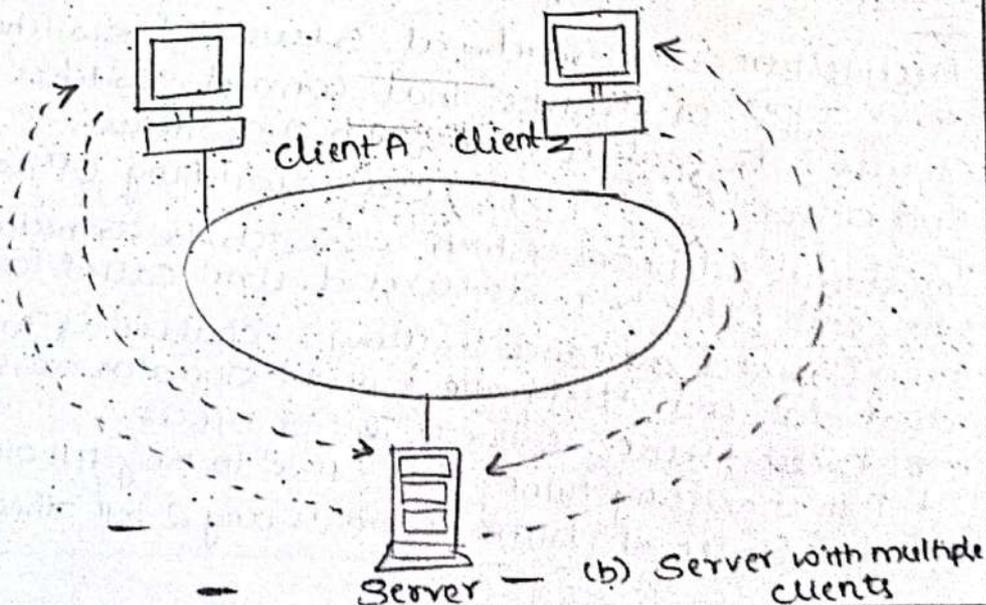


(a) Simple client-server model

→ Client initiates request to server & waits. The server executes the process to provide requested service & sends results to client.

10M

→ Each request is processed by FIFO rule. The server may be providing services to many clients that are connected to it on LAN as shown in fig (b).



(b) Server with multiple clients

CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SCHEME FOR EVALUATION

CIE TEST I

SEMESTER & SECTION: VII - A, B

DATE: 28/10/2022

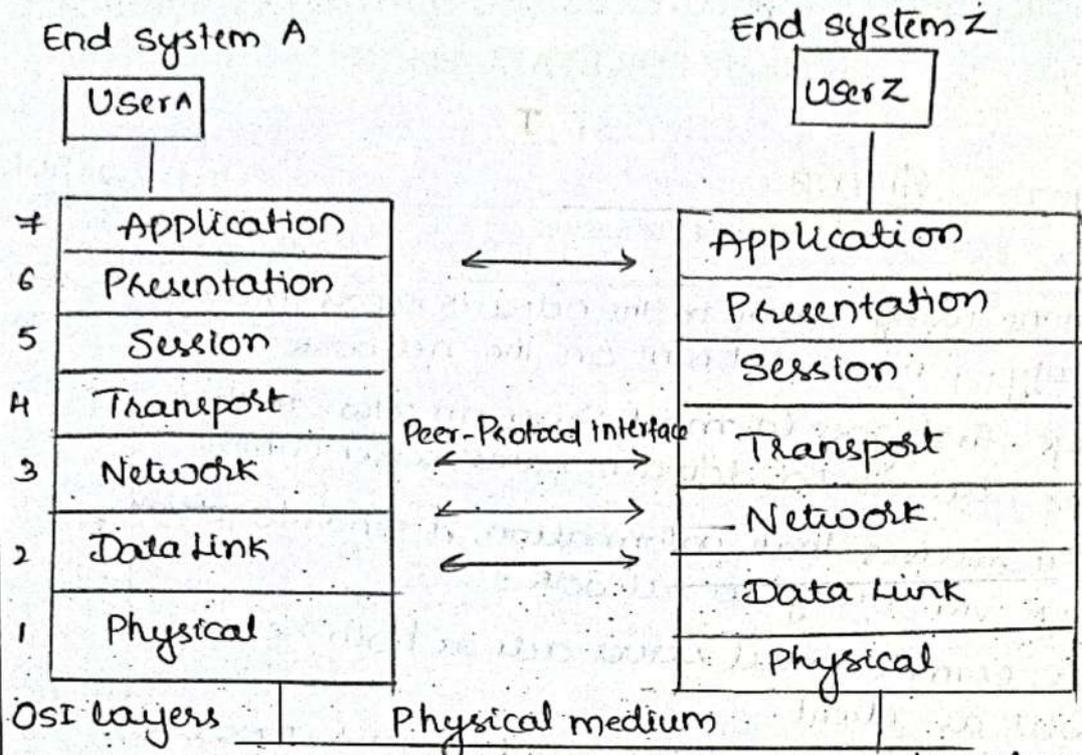
Q. No	Details of the Answer	Marks Distribution	Total marks
	<p>→ Joe. Stone using client in the network sends message to Sally. Jones @ dest.com on the network.</p> <p>→ message first goes to mail server on n/w. It then makes request to domain name server (DNS).</p> <p>→ when it receives that information, it sends to joe.stone message via bridge to network.</p> <p>→ In this example, mail server acts as both server & as well as client.</p> <p>→ 3 processes namely client, mail server & DNS are considered co-operative computing processes communication b/w them is called peer-to-peer.</p> <div style="text-align: center;"> </div> <p>(c) Dual role of client/server.</p>		

Staff Signature:

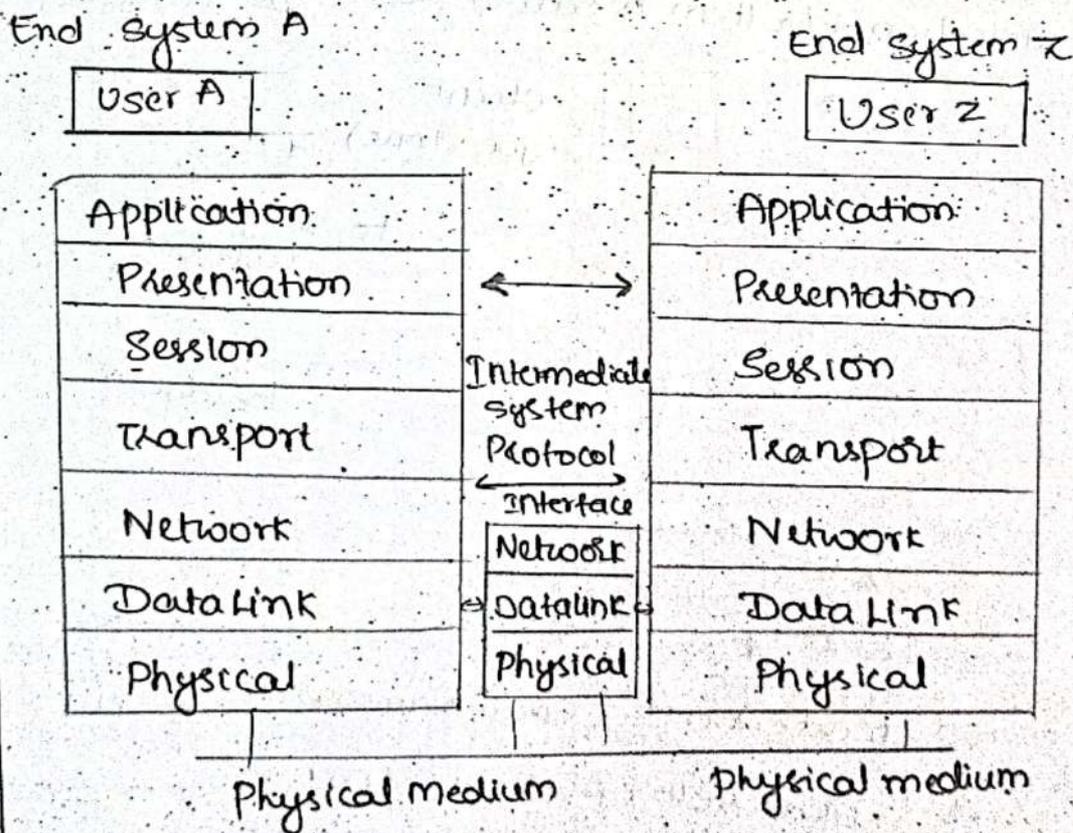
[Handwritten Signature]

LOB

3) OSI COMMUNICATION ARCHITECTURE MODEL



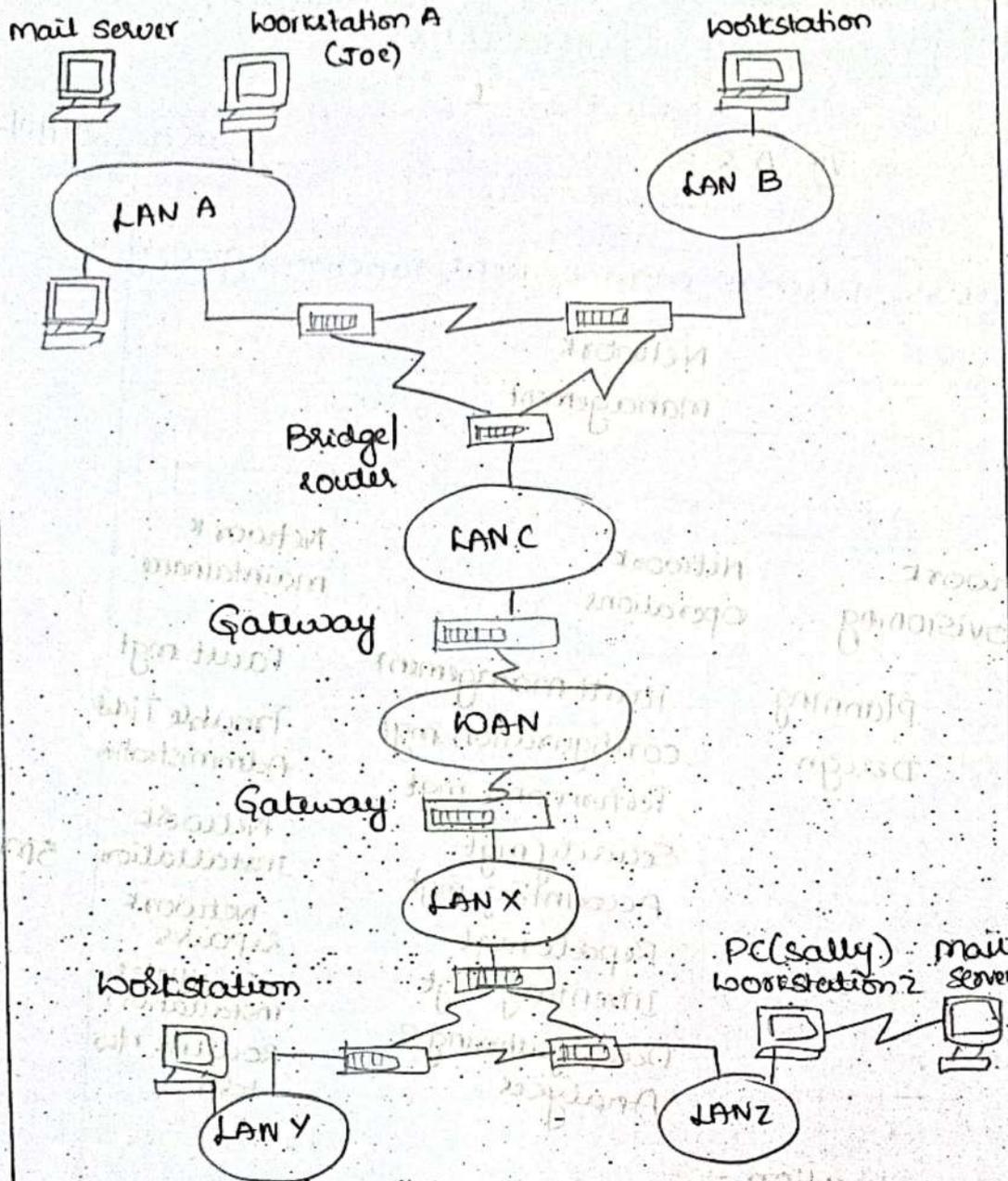
(a) Direct communication b/w end systems



(b) Communication b/w End systems via an Intermediate system.

10M

5) Internet & Intranet models.



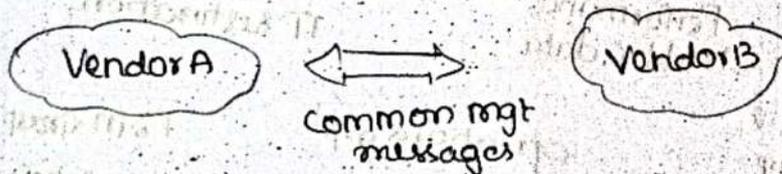
5M

10M

5M

Explanation - TCP/IP based Network : Sally Jones exam

6) Network management Dumbell architecture



(a) functional

vendor Systems A & B exchange common management messages. Message consists of management information data (type id, status of mgt objects) & management controls (setting & changing configuration of object).

5M

CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SCHEME FOR EVALUATION

CIE TEST I

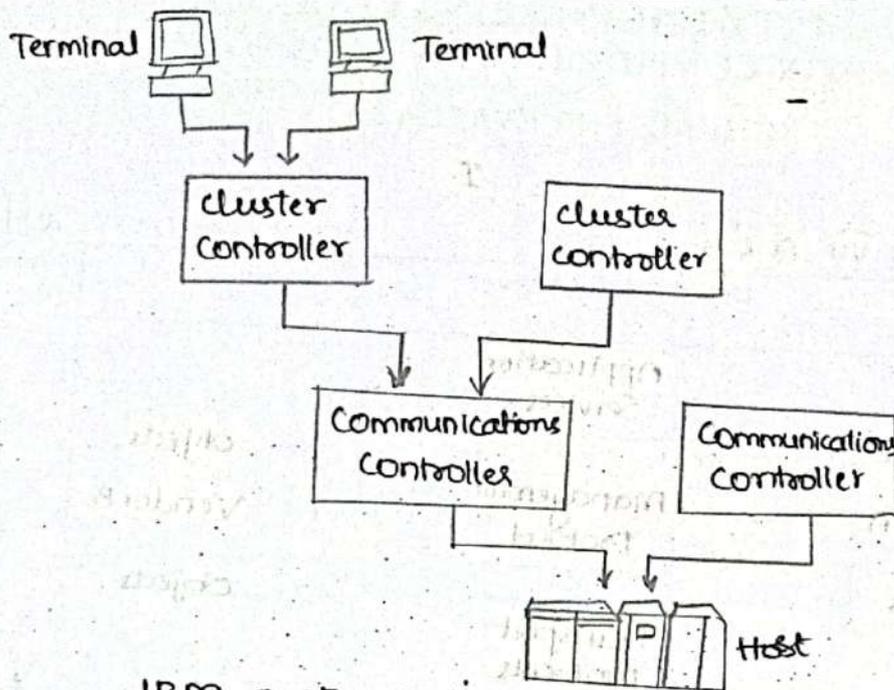
SEMESTER & SECTION: VII A & B

DATE: 28/10/2024

Q. No	Details of the Answer	Marks Distribution	Total marks
	<p>(b) services & protocols</p> <p>Network management Components</p> <p>7) IBM System architecture model</p> <p>Data communication Network</p> <p>Telecommunications network</p>	5m	10m

Staff Signature: [Signature]

[Signature]
HOD



IBM systems Network Architecture model.

- 8) Challenges of IT managers
- * Analyzing problems which requires intuition & skills
 - * Anticipating customer demands
 - * Allocating resources
 - * Managing client/server environment
 - * Networking with emerging technology
 - * Collaborative research b/w academic institution & industry
 - * Maintaining reliability
 - * Diagnosing problems or outages in a non-disruptive manner
 - * Estimating value of a technology transition
 - * Maintaining a secure firewall between the internal network & the internet
 - * Sustainable network that is scalable & maintainable
 - * Staying abreast of rapid advance of technology
 - * Determining responsibility for outages to the WAN

CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SCHEME FOR EVALUATION

CIE TEST I

SEMESTER & SECTION: VII 'A' & 'B'

DATE: 28/10/2022

Q. No	Details of the Answer	Marks Distribution	Total marks
9)	<p>Network management goals.</p> <ul style="list-style-type: none"> * Goal of Network management is to ensure that the users of network receive information technology services with the quality of service that they expect. * management should establish policy to either formally or informally contract a service level Agreement (SLA) with users. <p>Network management functions</p> <p>① Network provisioning:-</p> <ul style="list-style-type: none"> → consists of Network planning & design & is responsibility of engineering group. → keeps track of new technology & introduces as needed. → what & when is needed is made through analysis of traffic & performance data provided by n/w operations. <p>② Network operations & NOC</p> <ul style="list-style-type: none"> → Functions of N/w operations are administered by NOC. → Includes <u>fault management</u> - involves detection & isolation of problem that caused failure & restoration of services. Automatic restoration - self-healing of trouble ticket is generated manually at NOC. → <u>Trouble Ticket administration</u> - Track problems until resolved. Periodic analysis of data maintained in db gives prob patterns for follow-up action. 		10m

Staff Signature: _____

[Signature]

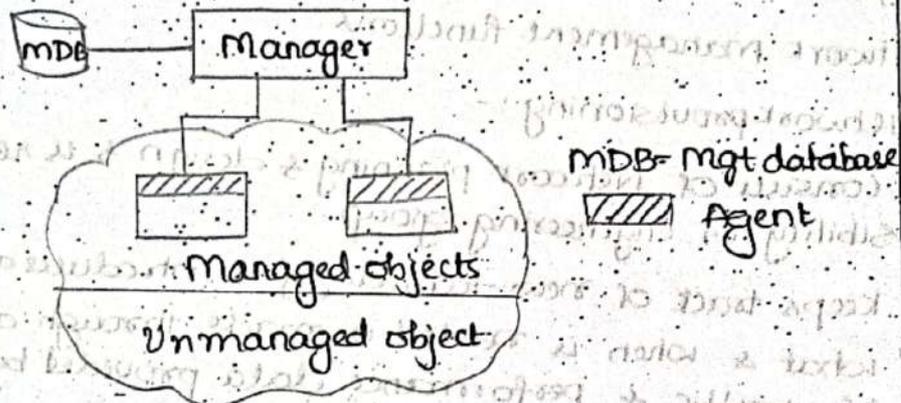
HOD

[Signature]

Q.No	Details of the Answer	Marks Distribution	Total marks
------	-----------------------	--------------------	-------------

- Configuration management: Includes permanent configuration (static configuration), current running configuration & planned configuration.
- NOC display - Network status, failure of components, traffic, performance.
- Dynamic display - Dynamic configuration of n/w & its status.
- Status of Network is displayed by NM & indicates failure of components, traffic patterns & performance.
- Configuration changes made to relieve temporary congestion are made by NOC & its reflected.

10) Organization model



Two-Hier Network Management model

Explanation:

The two-tier network management model is a hierarchical approach to network management. It consists of two levels: the Network Management System (NMS) at the top and the Network Element (NE) at the bottom. The NMS is responsible for monitoring and controlling the entire network, while the NE is responsible for monitoring and controlling individual network elements. This model allows for efficient management of large networks by delegating tasks to specialized components.

LESSON PLAN
CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN 2021-22

SUBJECT: NETWORK MANAGEMENT
FACULTY NAME: MRS. SHRUTHI VIJAY
SUBJECT CODE: 18CS742

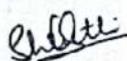
SEM: VII

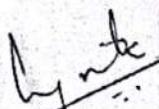
SEC: A & B

Week	Date		Topics Planned
	From	To	
I	19/09/22	23/09/22	Introduction: Analogy of Telephone Network Management, Data and Telecommunication Network Distributed computing Environments, TCP/IP-Based Networks: The Internet and Intranets, Communications Protocols and Standards-Communication Architectures, Protocol Layers and Services
II	26/09/22	30/09/22	Case Histories of Networking and Management – The Importance of topology , Filtering Does Not Reduce Load on Node, Some Common Network Problems; Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions- Goal of Network Management, Network Provisioning.
III	3/10/22	7/10/22	Network Operations and the NOC, Network Installation and Maintenance; Network and System Management, Network Management System platform, Current Status and Future of Network Management, Basic Foundations: Standards, Models, and Language: Network Management Standards
IV	10/10/22	14/10/22	Network Management Model, Organization Model, Information Model – Management Information Trees, Managed Object Perspectives, Communication Model
V	24/10/22	28/10/22	ASN.1- Terminology, Symbols, and Conventions, Objects and DataTypes, Object Names, An Example of ASN.1 from ISO 8824; Encoding Structure; Macros, Functional Model. FIRST CIE
VI	31/10/22	4/11/22	SNMPv1 Network Management: Managed Network: The History of SNMP Management, Internet Organizations and standards, Internet Documents, The SNMP Model, The Organization Model, System Overview.
VII	7/11/22	11/11/22	The Information Model – Introduction, The Structure of Management Information, Managed Objects, Management Information Base. The SNMP Communication Model – The SNMP Architecture, Administrative Model, SNMP Specifications, SNMP Operations, SNMP MIB Group
VIII	14/11/22	18/11/22	Functional Model SNMP Management – RMON: Remote Monitoring, RMON SMI and MIB, RMON1- RMON1 Textual Conventions, RMON1 Groups and Functions, Relationship Between Control and Data Tables, RMON1 Common and Ethernet Groups, RMON Token Ring Extension Groups, RMON2 – The RMON2 Management Information Base, RMON2 Conformance Specifications.

LESSON PLAN

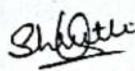
IX	21/11/22	25/11/22	Broadband Access Networks, Broadband Access Technology; HFCT Technology: The Broadband LAN, The Cable Modem, The Cable Modem Termination System, The HFC Plant, The RF Spectrum for Cable Modem; Data Over Cable, Reference Architecture; HFC Management – Cable Modem and CMTS Management
X	28/11/22	02/12/22	HFC Link Management, RF Spectrum Management, DSL Technology; Asymmetric Digital Subscriber Line Technology – Role of the ADSL Access Network in an Overall Network, ADSL Architecture, ADSL Channeling Schemes, ADSL Encoding Schemes; ADSL Management – ADSL Network Management Elements
XI	05/12/22	9/12/22	ADSL Configuration Management, ADSL Fault Management, ADSL Performance Management, SNMP-Based ADSL Line MIB, MIB Integration with Interfaces Groups in MIB-2, ADSL Configuration Profiles
XII	12/12/22	16/12/22	SECOND CIE Network Management Applications: Configuration Management- Network Provisioning, Inventory Management, Network Topology, Fault Management- Fault Detection, Fault Location and Isolation 24 Techniques
XIII	19/12/22	23/12/22	Performance Management – Performance Metrics, Data Monitoring, Problem Isolation, Performance Statistics; Event Correlation Techniques – Rule-Based Reasoning, Model-Based Reasoning, Case Based Reasoning, Codebook correlation Model, State Transition Graph Model, Finite State Machine Model
XIV	26/12/22	30/12/22	Security Management – Policies and Procedures, Security Breaches and the Resources Needed to Prevent Them, Firewalls, Cryptography, Authentication and Authorization, Client/Server Authentication Systems, Messages Transfer Security, Protection of Networks from Virus Attacks, Accounting Management, Report Management, Policy- Based Management, Service Level Management. THIRD CIE
31/12/022			Last Working Day


Teacher Signature


HOD Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
- MODULE - 1 -		
19-09-2022	4th	Analogy of Telephone n/w management, Data & Telecommunication n/w, Distributed environments, TCP/IP based Networks - Internet & Intranets.
20-09-2022	2nd	Protocols & standards, communication architecture, Protocol layers and services, case histories.
21-09-2022	1st	Challenges of IT Managers, Goals of N/w management - Network provisioning, NOC.
26-09-2022	4th	Network ISM, N/w & System management, current status & future of Network management.
- MODULE 2 -		
03-10-2022	4th	Network management standards, Network management model.
06-10-2022	4th	Organization model, Information model.
07-10-2022	3rd	Management Information tree, in detail.
10-10-2022	4th	Managed object perspectives, Communication model.
11-10-2022	2nd	ASN.1 - Terminology, Symbols & Conventions.
12-10-2022	1st	Objects and datatypes, Object Names.
17-10-2022	4th	An example of ASN.1 from ISO 8824.
18-10-2022	2nd	Encoding Structure - TLV. 'OCIB'H encoding.
19-10-2022	1st	Macros, Functional Model. - MODULE 3 -
21-10-2022	1st	SNMPv1 Network management - History.
25-10-2022	2nd	Internet Organization & standards.
02-11-2022	1st	Internet Documents, The SNMP model.
07-11-2022	4th	Organization model, System Overview.



 Teacher's Signature



 HOD'S Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
08-11-2022	2 nd	Information model, Structure of Management Info
09-11-2022	1 st	Managed objects, Management Information Base.
14 th -11-2022	4 th	SNMP Communication model, SNMP Architecture
15-11-2022	2 nd	Administrative model, Specifications, SNMP Operations, SNMP MIB Group.
16-11-2022	1 st	functional model, RMON - SMI & MIB
21-11-2022	4 th	RMON1 - Conventions, Groups & Functions.
22-11-2022	2 nd	Relationship b/w Data & Control tables.
23-11-2022	1 st	RMON Token Ring Extension groups, RMON2 - MIB, Conformance specifications.
28-11-2022	4 th	- MODULE 4 -
		Broadband Access n/w, Access Technology
		HFC Technology in detail.
29-11-2022	2 nd	Broadband LAN, Cable Modem.
30-11-2022	1 st	Cable modem Termination system, HFC plant
05-12-2022	4 th	RF Spectrum, CMTS Management.
06-12-2022	2 nd	HFC Link Management, DSL Technology.
07-12-2022	1 st	Introduction to ADSL in Overall Network.
07-12-2022	2 nd	ADSL Architecture, Channelling schemes, Encoding schemes - ADSL.
08-12-2022	4 th	ADSL management - Management Elements, ADSL Configuration Management.
09-12-2022	1 st	ADSL Fault Management, Performance Management, ADSL-MIB, Configuration profiles.

[Signature]

.....
Teacher's Signature

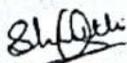
[Signature]

.....
HOD'S Signature



RECORD OF CLASS WORK

Date	Period	Topics Covered
		- MODULE 5 -
19-12-2022	4 th	Network management applications.
20-12-2022	2 nd	Fault management - Detection, Location & Isolation - 24 techniques.
21-12-2022	1 st	Performance management.
26-12-2022	3 rd	Event co-relation techniques.
26-12-2022	4 th	Security management - Firewalls, Cryptography, Authentication & Authorization
27-12-2022	2 nd	Protection from Virus Attacks, Accounting management, Reporting Management, policy & Service level Management.
		I IA = 27/10/2022 - 29/10/2022
		II IA = 12/12/2022 - 14/12/2022
		III IA = 28/12/2022 - 30/12/2022
31-12-2022	-	LAST WORKING DAY -



Teacher's Signature



HOD'S Signature



CITY
ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CIRCULAR

Ref: CEC/ECE/DAC/2022-2023/02

Date: 22-05-2023

All the members of Department Advisory Committee are informed to attend a meeting which will be held as follows

Date: 23/05/2023

Time: 10.30 AM Venue: LAB A206

Agenda:

- Certification course for 3rd year
- Organizing workshop for final year
- Conduction of Project Exhibition
- Industrial Visit
- Conduction of guest lectures/ workshops


Prof. Mallikarjuna G S

HOD



CITY
ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Department Advisory Committee Meeting

Date: 23/05/2023

Time: 10.30 AM

Venue: Room No. A206

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Prof. Mallikarjuna G S	HOD	Convenor	<i>G.S. Mallikarjuna</i>
2	Dr. Shalini Prasad	Professor	Co-Convenor	<i>S. Prasad</i>
3	Prof. Shylaja K	Assistant Professor	Member	<i>Shylaja K</i>
4	Prof. Ravindra S	Assistant Professor	Member	<i>R</i>
5	Prof. Krishna K S	Assistant Professor	Member	<i>K S</i>
6	Prof. Sai KrishnaLakshmi N	Assistant Professor	Member	<i>SKLN</i>

The Department Advisory Committee meeting was conducted at Department of ECE, on 23rd May, 2023, at 10:30 am.

Agenda of the Meeting:

- Certification course for 3rd year
- Organizing workshop for final year
- Conduction of Project Exhibition
- Industrial Visit
- Conduction of guest lectures/ workshops



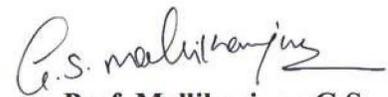
CITY
ENGINEERING COLLEGE

Minutes of Meeting:

In the Department Advisory Committee meeting, an overview of the department was presented, emphasizing student achievements, result analysis, and faculty accomplishments. The members discussed various suggestions for improvement and reviewed the meeting agenda.

The Committee proposed the following items for inclusion in the agenda:

- A certificate course on cyber security for third-year students was recommended. This course would not only enhance their programming skills but also deepen their understanding of data analytics concepts.
- It was agreed to organize a workshop on the Internet of Things (IoT) for final-year students.
- Second-year students can be involved in technical activities and encouraged to attend guest lectures or seminars.
- A project exhibition was proposed to give final-year students an opportunity to showcase their projects.
- To increase awareness of current technologies, the committee suggested organizing workshops, guest lectures, and hands-on sessions.


Prof. Mallikarjuna G S

HOD



CITY
ENGINEERING COLLEGE

VISION

Making Remarkable Contribution by Disseminating Knowledge on Emerging Trends in Engineering and Technology through various Programmes, Innovation and Research so as to Excel in Quality both at National and International level and to provide Career Guidance & Training for Employment.

MISSION

M1- To encourage Knowledge Acquisition and Foster Innovation & Research.

M2- To Prepare Students for Immediate Employment, leading to Technological and Socio- economical growth.

M3- To Provide Guidance for a Productive Career under various programmes.



CITY
ENGINEERING COLLEGE

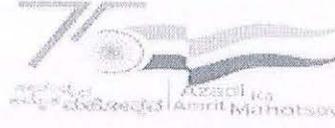
PROGRAM OUTCOMES (PO)

- PO1 – Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2 – Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3 – Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4 – Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5 – Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO6 – The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7 – Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8 – Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9 – Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10 – Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11 – Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12 – Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcome

Electronics & Communication Engineering: Analyze and Design analog & digital circuits or systems. Implement functional blocks of hardware-software co-designs for signal processing and communication applications.

Work with respect for societal values and concern for environment in implementing engineering solutions.



ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

ವಿಜಯಲದಿನಿಯಮಂ ೯೯೪ ರ ಅಡಿಯಲ್ಲಿ ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

State University of Government of Karnataka Established as per the VTU Act, 1994 "JnanaSangama" Belagavi-590018, Karnataka, India

Prof. B. E. Rangaswamy, Ph.D
REGISTRAR

Phone: (0831) 2498100
Fax: (0831) 2405467

REF: VTU/BGM/GC/2023/ 712

DATE: 9 MAY 2023

Revised-NOTIFICATION

Subject: Tentative Academic Calendar of II Semester B.E./B.Tech., B.Arch and B.Plan and IV semester B.E./B.Tech., programs of University regarding...

Reference: Hon'ble Vice-Chancellor's approval dated: 9 MAY 2023

The computer-Aided Engineering Drawing (BCEDK103) examinations of II semester B.E./B.Tech., programs are scheduled between 15.05.2023 to 24.05.2023. A revised Academic Calendar (Tentative) of II Semester B.E./B.Tech., B.Arch and B.Plan and IV semester B.E./B.Tech., programs of the University for the academic year 2022-23 are hereby notified as mentioned below;

(Tentative) Academic Calendar for semesters of II semester B.E./B.Tech./B.Arch./B.Plan and IV semester B.E./B.Tech., Programs for AY 2022-23 (May 2023)			
	II Semester B.E./B.Tech. (2022 scheme)	II Semester B. Arch, B. Plan (2021 scheme)	IV Semester B.E./ B.Tech (2021 scheme)
Commencement of the semester	25.05.2023	17.05.2023	17.05.2023
Internship	-----	-----	17.05.2023 To 03.06.2023
Commencement of the Classes	25.05.2023	17.05.2023	05.06.2023
Last Working day of the Semester	09.09.2023	31.08.2023	16.09.2023
Practical Examination/Viva Examination	11.09.2023 To 20.09.2023	01.09.2023 To 08.09.2023	19.09.2023 To 30.09.2023
Theory Examinations	21.09.2023 To 21.10.2023	11.09.2023 To 27.09.2023	03.10.2023 To 20.10.2023
Commencement of next Semester	25.10.2023	09.10.2023	25.10.2023

R

Please Note:

- The academic sessions for EVEN semesters should commence on the **date mentioned** above. The **induction program** shall be conducted for 10 days for 2nd-semester students. Scheduling the induction program's activities during the afternoon session in the 1st week is advised, the remaining sessions of induction programs shall be planned on Saturdays. The colleges must email a brief report to **sbhalbhavi@vtu.ac.in** after completing the Induction program
- The college may hold extra classes on Saturdays and Sundays to complete academic activities within the specified timeframe.
- The faculty/staff shall be available to undertake any work assigned by the university.
- University Examination Calendars will be published by the Registrar (Evaluation) from time to time.
- The Academic Calendar may be modified as MHRD/UGC/AICTE/state governments issue guidelines/directives in the future.
- Academic calendars are also applicable to autonomous colleges. If any changes are to be made by Autonomous colleges in the academic terms and examination schedule, they could do so with the approval of the university
- If any clarification/correction/suggestions, please email **sbhalbhavi@vtu.ac.in**

The principals of engineering colleges under the ambit of the University, are hereby informed to bring the academic calendar to the notice of all concerned. The Chairpersons of the PG department of the University where UG programs are offered are hereby informed to bring the academic calendar to the notice of the all concerned

The Directors of Schools of Architecture and Planning under the ambit of the university are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The principal of all engineering colleges, Directors of Schools of Architecture and Planning, under the ambit of VTU Belagavi. The Chairperson of the PG Department of the university.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director I/c. ITI SMU, VTU Belagavi for information and to make arrangements to upload Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director of Central Placement Officer VTU Belagavi for information
7. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

Rao B.E
09/05/23
REGISTRAR
A.



CITY ENGINEERING COLLEGE

COE- 2022-23 Even SEM

May 2023		June 2023		July 2023		Aug 2023		Sept 2023		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON	1									
TUE	2					1				
WED	3					2				
THU	4		1			3				
FRI	5		2			4		1		Start of II sem Practical
SAT	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday	5	1st Saturday holiday	2	1st Saturday holiday
SUN	7		4		2		6		3	
MON	8		5	4th sem start 8th sem Practical	3		7		4	
TUE	9		6	Orientation for 4 th Sem	4		8		5	
WED	10		7		5		9		6	
THU	11		8		6		10		7	
FRI	12		9		7		11		8	
SAT	13		10		8		12		9	II sem last working day
SUN	14		11		9		13		10	
MON	15		12		10	VI SEM LAST WORING day	14		11	Start of II sem Practical Exam
TUE	16	8th sem theory exam	13		11	6 TH sem practical exam	15	Independence day	12	4 th Sem – III CIE
WED	17		14		12		16		13	
THU	18	8th sem theory exam	15		13		17	4 th Sem – II CIE	14	
FRI	19		16		14		18		15	IV sem last working day
SAT	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday	19	3rd Saturday holiday	16	3rd Saturday holiday
SUN	21		18		16		20		17	
MON	22		19		17		21		18	Ganesha festival
TUE	23		20		18		22		19	Start of IV sem Practical
WED	24		21		19		23		20	
THU	25	II SEM START	22		20		24		21	Start of II sem Theoryexam
FRI	26		23		21		25		22	
SAT	27		24		22		26		23	
SUN	28		25		23		27		24	
MON	29		26		24	6TH sem Theory exam	28		25	
TUE	30		27		25		29		26	
WED	31		28		26		30		27	
THU			29	Bakrid	27		31		28	Id Milad
FRI			30		28				29	
SAT					29	Moharam			30	
SUN					30				31	
MON					31					

PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BARGA, URE - 500 051



CITY ENGINEERING COLLEGE

Department of ECE

COE- 2022-23 Even SEM

	May 2023		June 2023		July 2023		Aug 2023		Sept 2023	
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON	1									
TUE	2						1			
WED	3						2			
THU	4		1				3			
FRI	5		2				4		1	Start of II sem Practical
SAT	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday	5	1st Saturday holiday	2	1st Saturday holiday
SUN	7		4		2		6		3	
MON	8		5	4th sem start 8th sem Practical	3		7		4	
TUE	9	Project Exhibition	6	Orientation for 4 th Sem	4		8		5	
WED	10		7		5		9		6	
THU	11		8		6		10		7	
FRI	12		9	GUEST LECTURE 1	7	4 th Sem - I CIE	11		8	
SAT	13		10		8		12		9	II sem last working day
SUN	14		11		9		13		10	
MON	15		12		10		VI SEM LAST WORING day	14		11	Start of II sem Practical Exam
TUE	16	8th sem theory exam	13		11	6 TH sem practical exam	15	Independence day	12	4 th Sem – III CIE
WED	17		14		12		16	4 th Sem – II CIE	13	
THU	18	8th sem theory exam	15		13		17		14	
FRI	19		16		14		18		15	IV sem last working day
SAT	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday	19	3rd Saturday holiday	16	3rd Saturday holiday
SUN	21		18		16		20		17	
MON	22		19		17		21		18	Ganesha festival
TUE	23		20		18		22		19	Start of IV sem Practical
WED	24		21	INDUSTRIAL VISIT	19		23		20	
THU	25	II SEM START	22		20	GUEST LECTURE 2	24		21	Start of II sem Theoryexam
FRI	26		23		21		25		22	
SAT	27		24		22		26		23	
SUN	28		25		23		27		24	
MON	29		26		24	6TH sem Theory exam	28		25	
TUE	30		27		25		29		26	
WED	31		28		26		30		27	
THU			29	Bakrid	27		31		28	Id Milad
FRI			30		28				29	
SAT				P.S. malikarjune	29	Moharam			30	 <small>PRINCIPAL CITY ENGINEERING COLLEGE Kanakapura Main Road, BANGALORE - 560 091</small>
SUN					30				31	
MON					31					



CITY ENGINEERING COLLEGE

Department of ECE

COE- 2022-23 - 6th SEM

	March 2023		April 2023		May 2023		June 2023		July 2023	
DAY	Date		Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	May day				
TUE					2					
WED	1				3	6 th Sem – I CIE				
THU	2				4		1			
FRI	3				5		2			
SAT	4		1	1st Saturday holiday	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday
SUN	5		2		7		4		2	
MON	6		3		8	8 th Sem- Project Exhibition	5	6 th Sem – II CIE	3	
TUE	7		4		9		6		4	
WED	8		5		10		7		5	
THU	9		6		11		8		6	6 th Sem – III CIE
FRI	10		7	Good Friday	12		9		7	
SAT	11		8		13		10		8	
SUN	12		9		14		11		9	
MON	13		10		15		12	INDUSTRIAL VISIT	10	6 th Sem Last Working Day
TUE	14		11		16	8 th sem theory exam	13		11	6 th sem practical exam
WED	15		12		17	IV sem Internship	14		12	
THU	16		13		18	8 th sem theory exam	15		13	
FRI	17		14	Ambedkar Jayanthi	19		16		14	
SAT	18		15	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday
SUN	19		16		21		18		16	
MON	20	6 th Sem Starts	17		22		19		17	
TUE	21		18	GUEST LECTURE 1	23		20		18	
WED	22	Ugadi	19		24	GUEST LECTURE 2	21		19	
THU	23		20		25		22		20	
FRI	24		21		26		23		21	
SAT	25		22	Ramzan	27		24		22	
SUN	26		23		28		25		23	
MON	27		24		29		26		24	6 th sem Theory exam
TUE	28	Sports and	25		30		27		25	
WED	29	Cultural Events	26		31		28		26	
THU	30	Ethnic Day	27				29	Bakrid	27	
FRI	31		28				30		28	
SAT			29						29	
SUN			30						30	

G.S. malikarjune

(Signature)
 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061



CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi
Doddakallasandra, Off Kanakapura Main Road,
Next to Gokulam Apartment, Bangalore - 560 062.



Department of Electronics and Communication Engineering

COURSE ALLOCATION

ACY:2022-23 (even)

Sl. No	Name of the Faculty	Course code and Name	Year & Sem	Sign
1	Dr. Shalini Prasad	21EC481 - Ability enhancement course. - Embedded C basics 18EC81 - Wireless communication 18ECP83 - Project work phase-II	II / 4th III / 5th IV / 6th	
2	Dr. Ravindra. S	21EC42 - DSP 18EC61 - Digital communication	II / 4th III / 5th	B
3	Mr.G.S. Mallikarjuna	Basic electrical BESCK		
4	Mrs. Shylaja.k	18CS653 - Supply chain management 18EC821 - Network security 18ECS84 - Seminar	III / 6th IV / 8th V / 8th	S
5	Mrs. Madhavi J Kulkarni	-	-	-
6	Mr. Gopikishan. J	21EC44 - Communication Theory 21ECL46 - Comm Lab-1 18EC185 - Internship	II / 4th II / 4th IV / 8th	
7	Mr. Vishva Kiran R.C	18EC185 - Internship	IV / 8th	V

Skandan

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 062

P.S. Reddy
HOD, ECE

Professor & Head
Dept. of Electronics &
Communication Engineering (E)
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bangalore-560 062



CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi
Doddakallasandra, Off Kanakapura Main Road,
Next to Gokulam Apartment, Bangalore - 560 062.



Department of Electronics and Communication Engineering

COURSE PREFERENCE

ACY:2023-24 (even)

Name of the Faculty: Dr. Shalini Prasad

Designation: Associate Professor

Sl.No	Course code and name	Year/Semester
01.	Wireless & cellular communication [18EC81]	2024/8 th
02.	Principles of communication system [BEC402]	2024/4 th
03.	Microwave and Antenna [21EC62]	2024/6 th
04.	VLSI Lab [21ECL66]	2024/6 th

S. Prasad

Faculty

C. S. Malinenju

HOD, ECE

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bangalore-560 061.



CITY ENGINEERING COLLEGE

Department of ECE

COE- 2022-23 - 6th SEM

	March 2023		Aril 2023		May 2023		June 2023		July 2023		
DAY	Date		Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
MON					1	May day					
TUE					2						
WED	1				3	6 th Sem – I CIE					
THU	2			4	1						
FRI	3			5	2						
SAT	4		1	1st Saturday holiday	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday	
SUN	5		2		7		4		2		
MON	6		3		8	8 th Sem- Project Exhibition	5	6 th Sem – II CIE	3		
TUE	7		4		9		6		4		
WED	8		5		10		7		5		
THU	9		6		11		8		6	6 th Sem – III CIE	
FRI	10		7	Good Friday	12		9		7		
SAT	11		8		13		10		8		
SUN	12		9		14		11		9		
MON	13		10		15		12	INDUSTRIAL VISIT	10	6 th Sem Last Working Day	
TUE	14		11		16	8 th sem theory exam	13		11	6 TH sem practical exam	
WED	15		12		17	IV sem Internship	14		12		
THU	16		13		18	8 th sem theory exam	15		13		
FRI	17		14	Ambedkar Jayanthi	19		16		14		
SAT	18		15	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday	
SUN	19		16		21		18		16		
MON	20	6 th Sem Starts	17		22		19		17		
TUE	21		18	GUEST LECTURE 1	23		20		18		
WED	22	Ugadi	19		24	GUEST LECTURE 2	21		19		
THU	23		20		25		22		20		
FRI	24		21		26		23		21		
SAT	25		22	Ramzan	27		24		22		
SUN	26		23		28		25		23		
MON	27		24		29		26		24	6 TH sem Theory exam	
TUE	28	Sports and	25		30		27		25		
WED	29	Cultural Events	26		31		28		26		
THU	30	Ethnic Day	27				29	Bakrid	27		
FRI	31		28				30		28		
SAT			29						29		
SUN			30						30		

G.S. malikarjune


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
EVEN 2022-2023 TIME TABLE

SEMESTER: IV EC 'A' SEC CBCS

2021 SCHEME

CLASS ROOM:A106

W.E.F : 05-06-2023

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:30 AM 10:20 AM	10:20AM 11:10 AM	11:10 AM 11:25 AM	11:25 AM 12:15 PM	12:15 PM 1:05 PM	1:05 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:30 PM
MON	21MAT41	21EC45	B R E A K	21EC42	21EC43	L U N C H	21ECL46		
TUE	21EC43	21EC42		21MAT41	21EC44		tutorials		
WED	21MAT41	21EC45		21EC43	21CIP47		21EC481		
THU	21EC42	21EC44		21EC43	21UH49		tutorials		
FRI	21EC44	21MAT41		21EC42	tutorials		tutorials		
SAT	INTERSHIP PRESENTATION			INTERSHIP PRESENTATION					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
21MAT41	MATHS - 4	Prof. Babitha
21EC42	Digital Signal Processing	Dr. Ravindra S
21EC43	Control and circuits	Prof. SKL Narayana
21EC44	Communication Theory	Prof.Gopikishan. J
21EC45	Biology for engineers	Prof. Meghana
21ECL46	Communication laboratory I	A1 Prof.Gopikishan. J, Prof. SKL Narayana
21EC481	Ability Enhancement courses IV Embedded C Basics	A1 Dr. Shalini prasad, Prof. Sravanthi K Ravi

G.S. malikarajun

HOD, Dept. of E&CE


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Mansakpura Main Road, BANGALORE - 560 091

PRINCIPAL

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EVEN 2022-2023 TIME TABLE

SEMESTER: VI EC 'A' SEC CBCS

2018 SCHEME

CLASS ROOM:A105

W.E.F : 20-03-2023

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:30 AM 10:20 AM	10:20AM 11:10 AM	11:10 AM 11:25 AM	11:25 AM 12:15 PM	12:15 PM 1:05 PM	1:05 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:30 PM
MON	18EC63	18EC641	B R E A K	18EC61	18EC62	L U N C H	18ECL66		
TUE	18EC61	18EC641		18EC62	18EC63		18ECL67		
WED	18EC62	18EC63		18EC653	18EC61				
THU	18EC653	18EC61		18EC62	18EC63				
FRI	18EC653	18EC63		18EC641	18EC61				
SAT									

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18EC61	DC	Dr.Ravindra.S
18EC62	ARM	Prof. Lathashree M
18EC63	MICROWAVE AND ANTENNA	Dr.Shalini prasad
18EC641	OS	Prof.Sravanthi K Ravi
18CS653	SCM	Prof.Shalaja K
18ECL66	EMBEDDED LAB	A1 Prof. Lathashree M
18ECL67	COMMUNICATION LAB	A1 Prof. SKL Narayana

G.S. malikarjune

HOD, Dept. of E&CE

Dr. Swamy
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 091

PRINCIPAL

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
EVEN 2022-2023 TIME TABLE

SEMESTER: VIII EC 'A' SEC CBCS

2018 SCHEME

CLASS ROOM: A104

W.E.F : 13-02-2023

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:30 AM 10:20 AM	10:20AM 11:10 AM	11:10 AM 11:25 AM	11:25 AM 12:15 PM	12:15 PM 1:05 PM	1:05 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:30 PM
MON	18EC821	18EC821	B R E A K	18EC81	TUT	L U N C H	18ECS84		
TUE	18EC81	18EC81		18EC821	TUT		18ECI85		
WED	18ECP83			18ECP83			18ECP83		
THU									
FRI									
SAT									

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18EC81	WC	Dr. Shalini Prasad
18EC821	NS	Prof. Shylaja. K
18ECP83	PROJECT WORK PHASRE II	Dr. Shalini Prasad
18ECS84	SEMINAR	Prof. Shylaja. K
18ECI85	INTERSHIP	Prof.Vishvakiran.R.C, Prof.Gopikishan. J



HOD, Dept. of E&CE



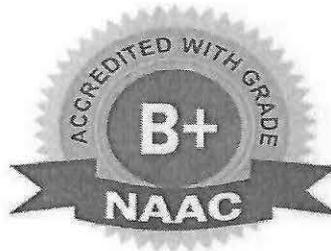
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 091

PRINCIPAL



CITY
ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING



COURSE FILE

NAME	Gopikishan. S
DESIGNATION	Asst prof
SEMESTER	4 th sem - 21EC44
SECTION	'A' section
SUBJECT NAME/CODE	Communication theory
ACADEMIC YEAR	EVEN 2022-23



CITY
ENGINEERING COLLEGE

VISION

Making Remarkable Contribution by Disseminating Knowledge on Emerging Trends in Engineering and Technology through various Programmes, Innovation and Research so as to Excel in Quality both at National and International level and to provide Career Guidance & Training for Employment.

MISSION

M1- To encourage Knowledge Acquisition and Foster Innovation & Research.

M2- To Prepare Students for Immediate Employment, leading to Technological and Socio- economical growth.

M3- To Provide Guidance for a Productive Career under various programmes.



CITY
ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

CONTENTS

1.	COLLEGE CALENDER OF EVENTS								
2.	DEPARTMENT CALENDER OF EVENTS								
3.	CLASS TIME TABLE AND INDIVISUAL TIME TABLE								
4.	UNIVERSITY SYLLABUS								
5.	LESSON PLAN								
6.	STUDENT LIST								
7.	RECORD OF CLASS WORK (SECTION WISE)								
8.	UNIVERSITY QUESTION PAPERS								
9.	MODULE WISE QUESTION BANK								
10.	ASSIGNMENT QUESTIONS								
11.	NEW TEACHING LEARNING INITIATIVES								
12.	REMIDIAL/TUTORIAL CLASSES CONDUCTED ,IF APPLICABLE								
13.	CONTINUOUS INTERNAL EVALUATION(CIE):								
	<table border="1"><tr><td>13.1</td><td>ATTENDANCE SHORTAGE LIST</td></tr><tr><td>13.2</td><td>CIE QUESTION PAPER AND SCHEME</td></tr><tr><td>13.3</td><td>TOPPERS LIST AND BELOW AVERAGE STUDENT LIST</td></tr><tr><td>13.4</td><td>COUNSELING FORM</td></tr></table>	13.1	ATTENDANCE SHORTAGE LIST	13.2	CIE QUESTION PAPER AND SCHEME	13.3	TOPPERS LIST AND BELOW AVERAGE STUDENT LIST	13.4	COUNSELING FORM
13.1	ATTENDANCE SHORTAGE LIST								
13.2	CIE QUESTION PAPER AND SCHEME								
13.3	TOPPERS LIST AND BELOW AVERAGE STUDENT LIST								
13.4	COUNSELING FORM								
14.	RESULT ANALYSIS AND FEEDBACK								
	<table border="1"><tr><td>14.1</td><td>FINAL CIE MARKS LIST (UNIVERSITY COPY)</td></tr><tr><td>14.2</td><td>SUBJECT RESULT AND STUDENT FEEDBACK</td></tr></table>	14.1	FINAL CIE MARKS LIST (UNIVERSITY COPY)	14.2	SUBJECT RESULT AND STUDENT FEEDBACK				
14.1	FINAL CIE MARKS LIST (UNIVERSITY COPY)								
14.2	SUBJECT RESULT AND STUDENT FEEDBACK								

CITY ENGINEERING COLLEGE					
DEPARTMENT OF ELECTRONICS & COMMUNIAION ENGINEERING					
4TH SEM	EVEN 2022-23	STUDENT LIST			
SL. NO.	USN	NAME			
1	1CE21EC001	AAKAANKSHA S KUMMUR			
2	1CE21EC002	AHMADI ALMAS KHANUM			
3	1CE21EC003	AKSHAYKUMAR M VASTRAD			
4	1CE21EC004	ATHIRA GUPTA R			
5	1CE21EC005	CHETAN D R			
6	1CE21EC006	DARSHAN PAUL B			
7	1CE21EC007	GAGAN C			
8	1CE21EC008	GEETHA D R			
9	1CE21EC009	HARSHITH C GOWDA			
10	1CE21EC010	KENCHAPPA Y R			
11	1CE21EC011	KRISHNAVENI L			
12	1CE21EC012	NAGARAJ			
13	1CE21EC013	NIVEDITHA P M			
14	1CE21EC015	SINDHU S			
15	1CE21EC016	SOUNDARYA P GANAPA			
16	1CE21EC017	VAMSHI KASHYAP S			
17	1CE22EC400	BHARATH G			
18	1CE22EC401	HARSHA L			
19	1CE22EC402	KEERTHI V M			
20	1CE22EC403	MOHAN RAJ D			
21	1CE22EC404	PUNEETH TR			
22	1CE22EC405	SATHYANARAYANA R G			
23	1CE22EC406	SHIVAMANI MR			
24	1CE22EC407	SUBIKSHA JIYER			
25	1CE22EC408	VARSHINI R			
26	1CE22EC409	YAKSHITH KUMAR P			
27		SHASHIDHAR C M			
28		SHREYAS GOWDA H T			

C.S. malikarjuna

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
B.E. in Electronics and Communication Engineering (ECE)
Scheme of Teaching and Examinations 2021
Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2021 - 22)

IV SEMESTER												
Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question and Paper Setting Board (PSB)	Teaching Hours /Week				Examination			Credits	
				Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks		Total Marks
				L	T	P	S					
1	BSC 21EC41	Maths for Communication Engineers	TD, PSB-Maths					03	50	50	100	3
2	IPCC 21EC42	Digital Signal Processing	TD: ECE PSB: ECE	3	0	2		03	50	50	100	4
3	IPCC 21EC43	Circuits & Controls	TD: ECE PSB: ECE	3	0	2		03	50	50	100	4
4	PCC 21EC44	Communication Theory	TD: ECE PSB: ECE	3	0	0	1	03	50	50	100	3
5	AEC 21BE45	Biology For Engineers	BT, CHE, PHY	2	0	0		02	50	50	100	2
6	PCC 21ECL46	Communication Laboratory I	TD: ECE PSB: ECE	0	0	2		03	50	50	100	1
7	HSMC 21KSK37/47	Samskrutika Kannada	HSMC	1	0	0		01	50	50	100	1
	HSMC 21KKB37/47	Balake Kannada										
	OR											
	HSMC 21CIP37/47	Constitution of India & Professional Ethics										
8	AEC 21EC48X	Ability Enhancement Course- IV	TD and PSB: Concerned department	If offered as theory Course				01	50	50	100	1
				1	0	0						
				If offered as lab. course				02				
				0	0	2						
9	UHV 21UH49	Universal Human Values	Any Department	1	0	0		01	50	50	100	1
10	INT 21INT49	Inter/Intra Institutional Internship	Evaluation By the appropriate authorities	Completed during the intervening period of II and III semesters by students admitted to first year of BE./B.Tech and during the intervening period of III and IV semesters by Lateral entry students admitted to III semester.				3	100	--	100	2
Total									550	450	1000	22

Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs

1	NCMC 21MATDIP41	Additional Mathematics - II	Maths	02	02	--	--	--	100	--	100	0
---	--------------------	-----------------------------	-------	----	----	----	----	----	-----	----	-----	---

Note: BSC: Basic Science Course, IPCC: Integrated Professional Core Course, PCC: Professional Core Course, AEC –Ability Enhancement Courses, HSMC: Humanity and Social Science and Management Courses, UHV- Universal Human Value Courses.

L –Lecture, T – Tutorial, P- Practical/ Drawing, S – Self Study Component, CIE: Continuous Internal Evaluation, SEE: Semester End Examination.

21KSK37/47 Samskrutika Kannada is for students who speak, read and write Kannada and 21KKB37/47 Balake Kannada is for non-Kannada speaking, reading, and writing students.

Integrated Professional Core Course (IPCC): Refers to Professional Theory Core Course Integrated with Practicals of the same course. Credit for IPCC can be 04 and its Teaching – Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from practical part of IPCC shall be included in the SEE question paper. For more details the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech.) 2021-22 may be referred.

A.S. Malikarjuna
Professor & Head

Dept. of Electronics &
 Communication Engineering
 City Engineering College,
 Doddakallasandra, Kanakapura Road, Bengaluru

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
B.E: Electronics & Communication Engineering / B.E: Electronics & Telecommunication Engineering
NEP, Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2021 – 22)

IV Semester

Communication Theory			
Course Code	21EC44	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:0:1	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	3	Exam Hours	3
<p>Course objectives: This course will enable students to</p> <ul style="list-style-type: none"> • Understand and analyse concepts of Analog Modulation schemes viz; AM, FM., Low pass sampling and Quantization as a random process. • Understand and analyse concepts digitization of signals viz; sampling, quantizing and encoding. • Evolve the concept of SNR in the presence of channel induced noise and study Demodulation of analog modulated signals. • Evolve the concept of quantization noise for sampled and encoded signals and study the concepts of reconstruction from these samples at a receiver. 			
<p>Teaching-Learning Process (General Instructions) These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> 1. Lecture method (L) does not mean only traditional lecture method, but different type of teaching methods may be adopted to develop the outcomes. 2. Show Video/animation films to explain evolution of communication technologies. 3. Encourage collaborative (Group) Learning in the class. 4. Ask at least three HOTS (Higher order Thinking) questions in the class, which promotes critical thinking. 5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it. 6. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them. 7. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding. 			
Module-1			
<p>AMPLITUDE MODULATION: Introduction, Amplitude Modulation: Time & Frequency Domain description, Switching modulator, Envelop detector.</p> <p>DOUBLE SIDE BAND-SUPPRESSED CARRIER MODULATION: Time and Frequency Domain description, Ring modulator, Coherent detection, Costas Receiver, Quadrature Carrier Multiplexing.</p> <p>SINGLE SIDE-BAND AND VESTIGIAL SIDEBAND METHODS OF MODULATION: SSB Modulation, VSB Modulation, Frequency Translation, Frequency Division Multiplexing, Theme Example: VSB Transmission of Analog and Digital Television.</p> <p>[Text1: 3.1 to 3.8]</p>			
Teaching-Learning Process	<p>Chalk and talk method, Power Point Presentation.</p> <p>Self-study topics: Properties of the Fourier Transform, Dirac Delta Function.</p> <p>RBT Level: L1, L2, L3</p>		
Module-2			
<p>ANGLE MODULATION: Basic definitions, Frequency Modulation: Narrow Band FM, Wide Band FM, Transmission bandwidth of FM Signals, Generation of FM Signals, Demodulation of FM Signals, FM</p>			

A.S. malikumar

Professor & Head
 Dept. of Electronics &
 Communication Engineering
 City Engineering College,
 Doddakallasandra, Kanakapura Main Road,
 Bengaluru-560 061

Stereo Multiplexing, Phase-Locked Loop: Nonlinear model of PLL, Linear model of PLL, Nonlinear Effects in FM Systems. The Superheterodyne Receiver [Text1: 4.1 to 4.6]

Teaching-Learning Process Chalk and talk method, Power Point Presentation, YouTube videos.
Self-study topics: FM Broadcasting System [Ref1]
RBT Level: L1, L2, L3

Module-3

NOISE: Shot Noise, Thermal noise, White Noise, Noise Equivalent Bandwidth.

NOISE IN ANALOG MODULATION: Introduction, Receiver Model, Noise in DSB-SC receivers. Noise in AM receivers, Threshold effect, Noise in FM receivers, Capture effect, FM threshold effect, FM threshold reduction, Preemphasis and De-emphasis in FM (Text1: 5.10, 6.1 to 6.6)

Teaching-Learning Process Chalk and talk method, Power Point Presentation, YouTube videos.
Self-study topics: Mean, Correlation and Covariance functions of Random Processes
RBT Level: L1, L2, L3

Module-4

SAMPLING AND QUANTIZATION: Introduction, Why Digitize Analog Sources? The Low pass Sampling process Pulse Amplitude Modulation. Time Division Multiplexing, Pulse-Position Modulation, Generation of PPM Waves, Detection of PPM Waves. (Text1: 7.1 to 7.7)

Teaching-Learning Process Chalk and talk method, Power Point Presentation, YouTube videos.
Self-study topics: T1 carrier systems [Ref1]
RBT Level: L1, L2, L3

Module-5

SAMPLING AND QUANTIZATION (Contd): The Quantization Random Process, Quantization Noise, Pulse-Code Modulation: Sampling, Quantization, Encoding, Regeneration, Decoding, Filtering, Multiplexing; Delta Modulation (Text1: 7.8 to 7.10), Application examples - (a) Video + MPEG (Text1:7.11) and (b) Vocoders (refer Section 6.8 of Reference Book 1)

Teaching-Learning Process Chalk and talk method, Power Point Presentation, YouTube videos.
Self-study topics: Digital Multiplexing. [Ref1]
RBT Level: L1, L2, L3

Course Outcomes (Course Skill Set)

At the end of the course the student will be able to:

1. Understand the amplitude and frequency modulation techniques and perform time and frequency domain transformations.
2. Identify the schemes for amplitude and frequency modulation and demodulation of analog signals and compare the performance.
3. Characterize the influence of channel noise on analog modulated signals.
4. Understand the characteristics of pulse amplitude modulation, pulse position modulation and pulse code modulation systems.
5. Illustration of digital formatting representations used for Multiplexers, Vocoders and Video transmission.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

A.S. Malikani

Professor & Head
 Dept. of Electronics &
 Communication Engineering
 City Engineering College

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks (duration 01 hour)**

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of **10 Marks**

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module.

Suggested Learning Resources:

Books

1. Simon Haykins & Moher, Communication Systems, 5th Edition, John Wiley, India Pvt. Ltd, 2010, ISBN 978 - 81 - 265 - 2151 - 7.

Reference Books

1. B P Lathi and Zhi Ding, Modern Digital and Analog Communication Systems, Oxford University Press., 4th edition, 2010, ISBN: 97801980738002.
2. Simon Haykins, An Introduction to Analog and Digital Communication, John Wiley India Pvt. Ltd., 2008, ISBN 978-81-265-3653-5.
3. H Taub & D L Schilling, Principles of Communication Systems, TMH, 2011.

C.S. Malikarjuna

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kerekapura Main Road
Bengaluru-560 061.



CITY ENGINEERING COLLEGE

Department of ECE

COE- 2022-23 Even SEM

May 2023			June 2023		July 2023		Aug 2023		Sept 2023	
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON	1						1			
TUE	2						2			
WED	3						3			
THU	4		1				4		1	Start of II sem Practical
FRI	5		2				5	1st Saturday holiday	2	1st Saturday holiday
SAT	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday	6		3	
SUN	7		4		2		7		4	
MON	8		5	4th sem start 8th sem Practical	3		8		5	
TUE	9	Project Exhibition	6	Orientation for 4 th Sem	4		9		6	
WED	10		7		5		10		7	
THU	11		8		6		11		8	
FRI	12		9	GUEST LECTURE 1	7	4 th Sem - I CIE	12		9	II sem last working day
SAT	13		10		8		13		10	
SUN	14		11		9		14		11	Start of II sem Practical Exam 4 th Sem - III CIE
MON	15		12		10	VI SEM LAST WORKING day	15	Independence day	12	
TUE	16	8th sem theory exam	13		11	6 TH sem practical exam	16		13	
WED	17		14		12		17	4 th Sem - II CIE	14	
THU	18	8th sem theory exam	15		13		18		15	IV sem last working day
FRI	19		16		14		19	3rd Saturday holiday	16	3rd Saturday holiday
SAT	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday	20		17	
SUN	21		18		16		21		18	Ganesha festival
MON	22		19		17		22		19	Start of IV sem Practical
TUE	23		20		18		23		20	
WED	24		21	INDUSTRIAL VISIT	19	GUEST LECTURE 2	24		21	Start of II sem Theoryexam
THU	25	II SEM START	22		20		25		22	
FRI	26		23		21		26		23	
SAT	27		24		22		27		24	
SUN	28		25		23		28		25	
MON	29		26		24	6TH sem Theory exam	29		26	
TUE	30		27		25		30		27	
WED	31		28		26		31		28	Id Milad
THU			29	Bakrid	27				29	
FRI			30		28				30	
SAT			31		29	Moharam			31	
SUN					30					
MON					31					

G's maharaj

[Signature]
CITY ENGINEERING COLLEGE
Kalyanapura Main Road, Bangalore, India - 560021

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COMMUNICATION THEORY ASSIGNMENT QUESTIONS

1. Explain the modulation techniques with neat diagram and explain the needs for modulation system.
2. Explain the amplitude modulation system with respect to time and frequency domain approach.
3. Explain the switching modulator with neat diagram.
4. Explain the detection of amplitude modulation wave.
5. An amplitude modulated signal is given by $s(t) = [10 \cos(2\pi \times 10^6 t) + 5 \cos(2\pi \times 10^6 t) \cos(2\pi \times 10^3 t) + 2 \cos(2\pi \times 10^6 t) \cos(4\pi \times 10^3 t)]$
Find i> total modulated power ii> sideband power iii> Net modulation index.
6. Consider a message signal $m(t) = 20 \cos(2\pi t)$ volts and a carrier signal $c(t) = 50 \cos(100\pi t)$ volts. Find i> the resulting AM wave for 75% modulation? II> sketch the spectrum of this AM wave.
III> find the power developed across the load of 100Ω .
7. A carrier wave $4\sin(2\pi \times 500 \times 10^3 t)$ volts is amplitude modulated by an audio wave $[0.2 \sin 3(2\pi \times 500t) + 0.1 \sin 5(2\pi \times 500t)]$ volts. Determine the upper and lower sideband and sketch the complete spectrum of the modulated wave. Estimate the total power in the sideband.
8. Explain RING modulator and its operation.
9. Explain COHERENT detector of DSBSC wave.
10. Explain Quadrature amplitude modulation?
11. Consider a message signal $m(t)$ with a spectrum shown in fig. the message bandwidth $W=1\text{kHz}$. this signal is applied to a product modulator, together with a carrier wave $A_c \cos(2\pi f_c t)$, producing the DSBSC modulated signal $S(t)$. the modulated signal is applied to a coherent detector. Assuming perfect synchronism between the carrier waves in the modulator and detector. Determine the spectrum of the detector output when i> $f_c = 1.25\text{kHz}$ ii> 0.75kHz what is the lowest frequency for which each component of the modulated signal $s(t)$ is uniquely determined by $m(t)$.
12. Explain vestigial sideband modulation and generation and detection of VSB modulated wave.
13. Explain the frequency translation.
14. Explain the frequency division multiplexing with neat diagram.
15. Consider a 2-stage SSB modulator as shown in fig. the input signal consist of a voice signal ia frequency range of 0.3 to 3.4kHz. the two oscillator frequencies have values $f_1 = 100\text{kHz}$ and $f_2 = 10\text{MHz}$. supply the following :
 - i> Sideband of DSBSC modulated waves appearing at the outputs of the product modulation.
 - ii> Sideband of SSB modulated waves appearing at two BPF outputs.
 - iii> Guardbands of the two BPFs.
 - iv> IV> Sketch the spectrum.


Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bengaluru-560 061.

1. Obtain the expression for an FM wave and also write the different waveforms.
2. Explain single tone frequency modulation with neat diagram?
3. a) Define frequency modulation, frequency deviation and modulation index.
b) A sinusoidal modulating wave of amplitude 5v and frequency 1khz is applied to a frequency modulator. The frequency sensitivity of the modulator is 50Hz/Volt. The carrier frequency is 100kHz calculate frequency deviation and modulation index.
4. Calculate the carrier swing, carrier frequency, Frequency deviation and modulation index for an FM signal which reaches a maximum frequency of 99.047 MHz and a minimum frequency of 99.023 MHz the frequency of the modulating signal is 7KHz.
5. The equation for an FM wave is $s(t) = 10 \sin[5.7 \times 10^8 t + 5 \sin 12 \times 10^3 t]$ calculate
i) carrier frequency ii) modulating frequency iii) modulation index iv) frequency deviation v) power dissipated in 100Ω .
6. Explain direct method of generating FM wave?
7. Explain balanced frequency discriminator?
8. Explain FM demodulation using phase locked loop(PLL)?
9. Explain non-linear and its effects in FM systems?
10. Explain FM Stereo multiplexing with neat diagram?
11. Explain FM Super heterodyne receiver with neat diagram?
12. Comparison between narrowband and wideband FM?

A.S. Malikanjuz

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Karakapura Main Road,
Bengaluru-560 061.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MODULE – 4

1. Give some comparison between analog and digital comm systems.
2. Explain the sampling process with the neat diagram of generation and detection of signals.
3. Explain time division multiplexing with neat diagram.
4. Explain the generation and detection of pulse position modulation technique.
5. An analog signal is expressed by the equation
 $x(t) = 1/2\pi (\cos (4000\pi t) \cos(1000\pi t))$.
Calculate the Nyquist rate and Nyquist interval for this signal.

MODULE -5

6. Explain the quantization process with neat diagram?
7. Explain the quantization noise?
8. Explain the Pulse code Modulation with neat diagram?
9. Explain the quantization in Pulse code Modulation?
10. Explain the encoding process in Pulse code Modulation and explain with neat diagram line code technique?



Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bengaluru-560 061.

CITY ENGINEERING COLLEGE

FIRST INTERNAL TEST

Branch: **Electronics and Communication Engg.**Date: **17/07/2023**Sub Name: **COMMUNICATION THEORY**Time: **10:30 Am – 12:00 Pm**Sem & Sec: **7th Sem**Max Marks: **50**Duration: **1 ½ hrs.**

Note: Answer all Questions selecting any ONE FULL questions from each part.

Qn. No.	Questions	Marks	CO's
---------	-----------	-------	------

PART-A

1.	Explain the modulation techniques with neat diagram and explain the needs for modulation system.	10	CO-1
----	--	----	------

OR

2.	An amplitude modulated signal is given by $s(t) = [10 \cos(2\pi \times 10^6 t) + 5 \cos(2\pi \times 10^6 t) \cdot \cos(2\pi \times 10^3 t) + 2 \cos(2\pi \times 10^6 t) \cdot \cos(4\pi \times 10^3 t)]$ Find i> total modulated power ii> sideband power iii> Net modulation index.	10	CO-1
----	--	----	------

PART-B

3.	Explain the amplitude modulation system with respect to time and frequency domain approach.	10	CO-1
----	---	----	------

OR

4	Consider a message signal $m(t) = 20 \cos(2\pi t)$ volts and a carrier signal $c(t) = 50 \cos(100\pi t)$ volts. Find i> the resulting AM wave for 75% modulation & sketch the spectrum of this AM wave. ii> find the power developed across the load of 100Ω .	10	CO-1
---	--	----	------

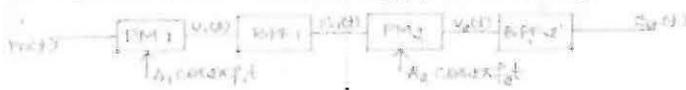
PART-C

5.	Explain RING modulator and its operation.	10	CO-1
----	---	----	------

OR

6.	A carrier wave $4\sin(2\pi \times 500 \times 10^3 t)$ volts is amplitude modulated by an audio wave $[0.2 \sin 3(2\pi \times 500 t) + 0.1 \sin 5(2\pi \times 500 t)]$ volts. Determine the upper and lower sideband and sketch the complete spectrum of the modulated wave. Estimate the total power in the sideband.	10	CO-1
----	--	----	------

PART-D

7.	Consider a 2-stage SSB modulator as shown in fig. the input signal consists of a voice signal in a frequency range of 0.3 to 3.4kHz. the two oscillator frequencies have values $f_1 = 100\text{KHz}$ and $f_2 = 10\text{MHz}$. supply the following:  i> Sideband of DSBSC modulated waves appearing at the outputs of the product modulation. ii> Sideband of SSB modulated waves appearing at two BPF outputs. iii> Guard bands of the two BPFs. iv> IV> Sketch the spectrum.	10	CO-1
----	--	----	------

OR

8.	Explain the frequency translation.	10	CO-1
----	------------------------------------	----	------

Course Outcomes:

CO-1: Understand the amplitude and frequency modulation techniques and perform time and frequency domain transformations.

C. S. Mahalingam

CITY ENGINEERING COLLEGE
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
SCHEME FOR VALUATION

CIE TEST: 1

Semester & Section: 4A Sub Code: 21EC44 Sub Name: Communication theory Date: 18/7/2023

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	modulation Techniques Block diagram → Explanation →	2+4+4	10M
2.	(i) modulated power. $P_T = P_c \left(1 + \frac{\mu^2}{2}\right)$ = 57.02W. (ii) sideband power $PSB = 7.02$ (iii) net modulation index = 0.53	4+2+4	10M
3.	Explain Amplitude modulation → Explanation → with Time & frequency domain →	3 3 2+2	10M


Staff


HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
4.	(i) sketch the spectrum of AM (ii) total power developed across	4 + 6	10M
5.	Explain Ring modulation →		10M
6.	the upper & lower sideband → total power in the sideband → 0.0559	4 6	10M
7.	(i) output of the product modulation → 100.3 kHz to 103.4 kHz } (ii) LSB = $S_2(f) = 10.10 \text{ MHz to } 10.103 \text{ MHz}$ } (iii) Guard band 9.89 MHz to 10.103 MHz } (iv) sketch the spectrum }	2 2 2 2	10M



Staff



HOD

2

Question No.	Details of the Answer	Marks Distribution	Total Marks
8.	Frequency translation → Explanations →	6 4	10M



Staff



HOD

CITY ENGINEERING COLLEGE
SECOND INTERNAL TEST

Branch: **Electronics and Communication Engg.**
Sub Name: **COMMUNICATION THEORY**
Sem & Sec: **4th Sem**
Duration: **1 ½ hrs.**

Date: **11/08/2023**
Time: **10:30 Am – 12:00 Pm**
Max Marks: **40**

Note: Answer all Questions selecting any ONE FULL question from each part.

Qn. No.	Questions	Marks	CO's
---------	-----------	-------	------

PART-A

1.	Obtain the expression for an FM wave and also write the different waveforms.	10	CO-2
----	--	----	------

OR

2.	Explain single tone frequency modulation with neat diagram?	10	CO-2
----	---	----	------

PART-B

3.	Explain non-linear and its effects in FM systems?	10	CO-2
----	---	----	------

OR

4	Explain direct method of generating FM wave?	10	CO-2
---	--	----	------

PART-C

5.	Explain balanced frequency discriminator?	10	CO-2
----	---	----	------

OR

6.	Explain FM demodulation using phase locked loop (PLL)?	10	CO-2
----	--	----	------

PART-D

7.	Explain FM Super heterodyne receiver with neat diagram?	10	CO-2
----	---	----	------

OR

8.	<p>a) Define frequency modulation, frequency deviation and modulation index.</p> <p>b) A sinusoidal modulating wave of amplitude 5v and frequency 1khz is applied to a frequency modulator. The frequency sensitivity of the modulator is 50Hz/Volt. The carrier frequency is 100kHz calculate frequency deviation and modulation index.</p>	10	CO-2
----	--	----	------

Course Outcomes:

CO-2: Identify the schemes for amplitude and frequency modulation and demodulation of analog signals and compare the performance.

C.S. Mahalingam

CITY ENGINEERING COLLEGE
THIRD INTERNAL TEST

Branch: **Electronics and Communication Engg.**
Sub Name: **COMMUNICATION THEORY**
Sem & Sec: **4th Sem**
Duration: **1 ½ hrs.**

Date: **07/09/2023**
Time: **10:30 Am – 12:00 Pm**
Max Marks: **40**

Note: Answer all Questions selecting any ONE FULL question from each part.

Qn. No.	Questions	Marks	CO's
PART-A			
1.	Give some comparison between analog and digital comm systems.	10	CO-4
<i>OR</i>			
2.	Explain the quantization noise?	10	CO-4
PART-B			
3.	Explain the sampling process with the neat diagram of generation and detection of signals.	10	CO-4
<i>OR</i>			
4.	Explain the quantization process with neat diagram?	10	CO-4
PART-C			
5.	Explain time division multiplexing with neat diagram.	10	CO-4
<i>OR</i>			
6.	Explain the Pulse code Modulation with neat diagram?	10	CO-4
PART-D			
7.	Explain the generation and detection of pulse position modulation technique.	10	CO-4
<i>OR</i>			
8.	An analog signal is expressed by the equation $x(t) = 1/2\pi (\cos (4000\pi t) \cos(1000\pi t))$. Calculate the Nyquist rate and Nyquist interval for this signal.	10	CO-4

Course Outcomes:

CO-4: Understand the characteristics of pulse amplitude modulation, pulse position modulation and pulse code modulation systems.

C.S. Mahalingam

CITY ENGINEERING COLLEGE
DEPARTMENT OF ELCECTRONICS & COMMUNICATION ENGINEERING
SCHEME FOR VALUATION

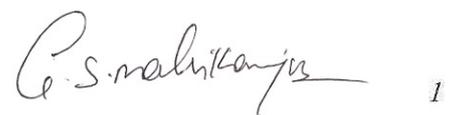
CIE TEST: 3

Semester & Section: L A Sub Code: 21ECH4 Sub Name: Communication Theory Date: 08/09/2023

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	any five comparison between analog & digital com. systems. →	5x2	10M
2.	Explain quantization noise → Diagram →	4 6	10M
3.	Explain Sampling process → Diagram →	4 6	10M
4.	quantization process → Diagram →	4 6	10M
5.	Time division multiplexing Diagram →	4 6	10M
6.	pulse code modulation Technique Diagram →	4 6	10M



Staff



HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
7.	the generation & detection of pulse position modulation Diagram →	10	10 M
8	$x(t) = \frac{1}{4\pi} [\cos(\omega_1 t) + \cos(\omega_2 t)]$ $\omega_1 = 3000\pi \text{ Hz}$ $\omega_2 = 5000\pi \text{ Hz}$ <p>Nyquist rate = 5000 Hz. *10000</p> <p>Nyquist interval = 0.2 ms.</p>	<p>4</p> <p>2</p> <p>2</p> <p>2</p>	10 M


Staff

 2
HOD

Quiz

1. The amount of frequency deviation in FM signal depends on
 - a) Amplitude of the modulating signal
 - b) Carrier frequency
 - c) Modulating frequency
 - d) Transmitter amplifier
2. Shot noise occurs in
 - a) Transistors
 - b) Valves
 - c) Transistors & Valves
 - d) None of the mentioned
3. Non uniform quantization includes
 - a) Compression
 - b) Expansion
 - c) Compression & Expansion
 - d) None of the mentioned
4. Different cases of sampling include
 - a) Ideal impulse sampling
 - b) Flat-topped sampling
 - c) Sampling with rectangular pulses
 - d) All of the mentioned
5. In which mixing is easier?
 - a) Analog signal
 - b) Digital signal
 - c) Analog & Digital signal
 - d) None of the mentioned
6. Super heterodyne receivers
 - a) Have better sensitivity
 - b) Have high selectivity
 - c) Need extra circuitry for frequency conversion
 - d) All of the above
7. The AM spectrum consists of
 - a) Carrier frequency
 - b) Upper side band frequency
 - c) Lower side band frequency
 - d) All of the above
8. The modulation technique that uses the minimum channel bandwidth and transmitted power is
 - a) FM
 - b) DSB-SC
 - c) VSB
 - d) SSB
9. Calculate the bandwidth occupied by a DSB signal when the modulating frequency lies in the range from 100 Hz to 10KHz.
 - a) 28 KHz
 - b) 24.5 KHz
 - c) 38.6 KHz
 - d) 19.8 KHz
10. The function of multiplexing is
 - a) To reduce the bandwidth of the signal to be transmitted
 - b) To combine multiple data streams over a single data channel
 - c) To allow multiple data streams over multiple channels in a prescribed format
 - d) To match the frequencies of the signal at the transmitter as well as the receiver

C.S. Malhotra

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

11. Aliasing refers to
 - a) Sampling of signals less than at Nyquist rate
 - b) Sampling of signals greater than at Nyquist rate
 - c) Sampling of signals at Nyquist rate
 - d) None of the above
12. The amount of data transmitted for a given amount of time is called
 - a) Bandwidth
 - b) Frequency
 - c) Noise
 - d) Signal power
13. Advantage of using a high frequency carrier wave is
 - a) Signal can be transmitted over very long distances
 - b) Dissipates very small power
 - c) Antenna height of the transmitter is reduced
 - d) All of the above
14. Modulation is required for
 - a) Reducing noise while transmission
 - b) Multiplexing the signals
 - c) Reduction in the complexity of circuitry
 - d) All of the above
15. Bandwidth required in SSB-SC signal is (f_m is modulating frequency):
 - a) $2f_m$
 - b) $< 2f_m$
 - c) f_m
 - d) $2f_m$
16. Demodulation is:
 - a) Detection
 - b) Recovering information from modulated signal
 - c) Both a and b
 - d) None of the above
17. Disadvantage of using a DSB or SSB signal modulation is
 - a) Difficult to recover information at the receiver
 - b) Carrier has to be locally generated at receiver
 - c) Both a and b are correct
 - d) None of the above
18. Frequencies that are located between adjacent channels to prevent interference are referred to as
 - a) sidebands
 - b) bandwidths
 - c) guard bands
 - d) blank channels
19. The primary advantage of phase modulation over frequency modulation is that phase modulation has better carrier
 - a) power stability
 - b) amplitude stability
 - c) frequency stability
 - d) directional stability
20. In Frequency Modulation –
 - a) Amplitude of the carrier remains same
 - b) Frequency of the carrier varies in accordance with the modulating signal
 - c) The number of side bands are infinite
 - d) All of the above

C. S. Malhan

ATTENDANCE

Sl. No.	Reg. No. ICE21	Communication theory. Name	Month 6											
			Day											
			5	6	7	12	13	15	16	20	22	23		
			4	2	1	4	2	1	4	4	2	1		
			1	2	3	4	5	6	7	8	9	10		
1	EC001	AAKAANKSHA . S. KUMMUR	1	2	3	4	5	6	7	8	9	10		
2	EC002	AHMADI . ALMAS . KHANUM	1	2	3	4	5	6	7	8	9	10		
3	EC003	AKSHAY KUMAR MAHALINGAYYA VASTRAO	1	2	3	4	5	6	7	8	9	10		
4	EC004	ATHIRA GUPTA . R.	1	2	3	4	5	6	7	8	9	10		
5	EC005	CHETAN . D . R	1	2	3	4	5	6	7	8	9	10		
6	EC006	DARSHAN PAUL . B.	1	2	3	4	5	6	7	8	9	10		
7	EC007	GAGAN . C.	1	2	3	4	5	6	7	8	9	10		
8	EC008	GEETHA . D . R	1	2	3	4	5	6	7	8	9	10		
9	EC009	HARSHITH . C . GOWDA	1	2	3	4	5	6	7	8	9	10		
10	EC010	KENCHAPPA . Y . R	1	2	3	4	5	6	7	8	9	10		
11	EC011	KRISHNAVENI . L	1	2	3	4	5	6	7	8	9	10		
12	EC012	NAGARAJ	1	2	3	4	5	6	7	8	9	10		
13	EC013	NIVEDITHA . P . M	1	2	3	4	5	6	7	8	9	10		
14	EC015	SINDHU . S.	1	2	3	4	5	6	7	8	9	10		
15	EC016	SOUNDARYA . P . GANAPA	1	2	3	4	5	6	7	8	9	10		
16	EC017	VAMSHI . KASHYAP . S.	1	2	3	4	5	6	7	8	9	10		
17	EC400	BHARATH . G.	1	2	3	4	5	6	7	8	9	10		
18	EC401	HARSHA . L.	1	2	3	4	5	6	7	8	9	10		
19	EC402	KEERTHI . V . M	1	2	3	4	5	6	7	8	9	10		
20	EC403	MOHAN . RAJ . D.	1	2	3	4	5	6	7	8	9	10		
21	EC404	PUNEETH . T . R	1	2	3	4	5	6	7	8	9	10		
22	EC405	SATHYANARAYANA . R . G	1	2	3	4	5	6	7	8	9	10		
23	EC406	SHIVAMANI . M . R	1	2	3	4	5	6	7	8	9	10		
24	EC407	SUBIKSHA J . TYER	1	2	3	4	5	6	7	8	9	10		
25	EC408	VARSHINI . R.	1	2	3	4	5	6	7	8	9	10		

A. S. Malikanjan

LESSON PLAN

Week	Date		Topics Planned
	From	To	
IX	31-7-2023	5-8-2023	Receiver model, noise in DSB-SC receiver, noise in AM receiver, Threshold effect. Noise in FM receiver, capture effect.
X	7-8-2023	12-8-2023	FM Threshold effect, FM Threshold reduction pre-emphasis and de-emphasis in FM. problems.
XI	14-8-2023	19-8-2023	Sampling, the low pass sampling. process pulse Amplitude modulation Time Division Multiplexing.
XII	21-8-2023	26-8-2023	pulse position modulation Generation of PPM waves. Detection of PPM waves.
XIII	28-8-2023	2-9-2023	The Quantizers Random process Quantizers noise, pulse code modulation Sampling, Quantization, Encoding, Regeneration
XIV	4-9-2023	9-9-2023	Decoding, Filtering, Multiplexing, Delta modulation, Applications Example (A) Video MPEG (B) Voceless.
XV			
XVI			



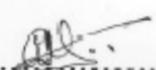
 Teacher's Signature



 HOD'S Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
5/6/2023	1	Introduction to Communication theory
6/6/2023	2	Amplitude modulation.
7/6/2023	1	Time & Frequency Domain Approach
12/6/2023	4	Switching Modulator, envelop detector
13/6/2023	2	Double Sideband Suppressed carrier Modulation
15/6/2023	1	Time & freq. Domain description
16/6/2023	1	Ring modulator
20/6/2023	4	problems.
22/6/2023	2	Quadrature Amplitude Modulations
23/6/2023	1	Frequency Translation
27/6/2023	4	SSB and VSB modulation
30/6/2023	2	Frequency Division Multiplexing.
4/7/2023	1	problems.
6/7/2023	4	RCBC definition, Frequency modulation:
15/7/2023	2	Narrow Band FM, wide band FM
13/7/2023	2	Transmission bandwidth of FM signal.
14/7/2023	1	Generation of FM signal, phase locked loop
18/7/2023	4	Demodulation, FM stereo multiplexing
20/7/2023	2	Nonlinear model of PLL, linear model of PLL.
21/7/2023	1	Nonlinear effects, Superheterodyne Receiver.
25/7/2023	4	Shot noise, Thermal noise, white, Noise Dens.
27/7/2023	2	Receiver model, noise in DSB-SC, noise in AM
28/7/2023	1	threshold effect, noise in FM, Capture effect. FM effect
1/8/2023	4	FM threshold reduction, Preemphasis and De-emphasis

.....

 Teacher's Signature

.....

 HOD'S Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
3/8/2023	2	Introduction, why digitize Analog sources.
4/8/2023	1	The low pass Sampling process.
8/8/2023	4	pulse Amplitude modulation
10/8/2023	2	Time Division Multiplexing
11/8/2023	1	pulse position modulation
16/8/2023	4	Generation of PPM wave
17/8/2023	2	problem
18/8/2023	1	problem
22/8/2023	4	Detectors of PPM waves
24/8/2023	2	problem.
25/8/2023	1	Quantization Random process.
1/9/2023	4	Quantization Noise, PCM
5/9/2023	2	Sampling, Quantization,
8/9/2023	1	Encoding, Regeneration, Decoding
12/9/2023	4	Filtering, multiplexing.
14/9/2023	2	Delta Modulation
15/9/2023	1	Some Examples
21/9/2023	2	problem
22/9/2023	1	Application Example.



 Teacher's Signature



 HOD'S Signature



CITY
ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CIRCULAR

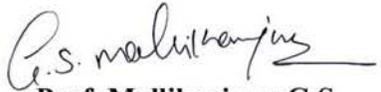
Ref No: CEC/ECE/DAC/ACY 2022-2023/01

Date: 08-08-2022

This is to inform the members of Department Advisory Committee that meeting is scheduled on 12/08/2022 at 11: 00 AM in ECE department at Lab A206.

Agenda:

- Discussion on 21 Scheme syllabus and changes in the subjects and topics
- Encouraging students participation in project exhibition
- Discussion on Citronics Club activities for third year students
- Alumni Interaction
- Conducting workshop/seminar/guest lectures


Prof. Mallikarjuna G S

HOD



CITY
ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Department Advisory Committee Meeting

Date: 12/08/2022

Time: 11:00 AM

Venue: Room No. A206

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Prof. Mallikarjuna G S	HOD	Convenor	<i>Mallikarjuna G S</i>
2	Dr. Shalini Prasad	Professor	Co-Convenor	<i>Shalini Prasad</i>
3	Prof. Shylaja K	Assistant Professor	Member	<i>Shylaja K</i>
4	Prof. Ravindra S	Assistant Professor	Member	<i>R</i>
5	Prof. Krishna K S	Assistant Professor	Member	<i>K S</i>
6	Prof. Sai KrishnaLakshmi N	Assistant Professor	Member	<i>skln</i>

The Department Advisory Committee meeting was conducted at Department of ECE, on 12th August, 2022, at 11 AM.

Agenda of the Meeting:

- Discussion on 21 Scheme syllabus and changes in the subjects and topics
- Encouraging students participation in project exhibition
- Citronics Club activities for third year students
- Alumni Interaction
- Conducting workshop/seminar/guest lectures



CITY
ENGINEERING COLLEGE

Minutes of Meeting:

During the Department Advisory Committee meeting, a comprehensive overview of the department was presented, highlighting student achievements as well as faculty accomplishments and contributions. The members engaged in a discussion on suggestions for improvement and reviewed the meeting agenda.

The following key points were addressed during the meeting:

- It was discussed that students entering their third semester are required to complete a three-week internship under the 21 Scheme. The committee deliberated on the guidelines and evaluation criteria for this internship.
- A Project Exhibition is scheduled for December. Faculty members were encouraged to motivate students to actively participate in this event.
- To inspire and empower our students by providing them with practical tools, strategic insights, real-world experiences, nurture their innovative thinking, business acumen, and problem solving skills, the committee decided to conduct a value added course .


Prof. Mallikarjuna G S

HOD



CITY
ENGINEERING COLLEGE

VISION

Making Remarkable Contribution by Disseminating Knowledge on Emerging Trends in Engineering and Technology through various Programmes, Innovation and Research so as to Excel in Quality both at National and International level and to provide Career Guidance & Training for Employment.

MISSION

M1- To encourage Knowledge Acquisition and Foster Innovation & Research.

M2- To Prepare Students for Immediate Employment, leading to Technological and Socio- economical growth.

M3- To Provide Guidance for a Productive Career under various programmes.



CITY
ENGINEERING COLLEGE

PROGRAM OUTCOMES (PO)

- PO 1 – Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO 2 – Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO 3 – Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO 4 – Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO 5 – Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO 6 – The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO 7 – Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO 8 – Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO 9 – Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO 10 – Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO 11 – Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO 12 – Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcome

Electronics & Communication Engineering: Analyze and Design analog & digital circuits or systems. Implement functional blocks of hardware-software co-designs for signal processing and communication applications.

Work with respect for societal values and concern for environment in implementing engineering solutions.

Academic Calendar for ODD Semester of UG programs for the year 2022-23

	I semester B.E./B.Tech.	I semester B.Arch./B.Plan	I semester B.Sc.	III sem. B.E./ B.Tech.	III Semester B.Arch.	III semester B. Plan	III Semester B.Sc.	V Semester B.E./B.Tech.	V Semester B.Arch./ B.Plan.	VII semester B.E./B.Tech.	VII semester B.Plan.	VII semester B.Arch	IX semester B.Arch
Commencement of ODD Semester	# 10.10.2022	# 10.10.2022	10.10.2022 (Tentative)	11.10.2022	31.10.2022	31.10.2022	10.10.2022	10.10.2022	12.09.2022	21.08.2022	21.08.2022	19.09.2022	01.09.2022
Internship				11.10.2022 To 30.10.2022						21.08.2022 To 17.09.2022	21.08.2022 To 24.09.2022		
Commencement of Classes				31.10.2022	31.10.2022	31.10.2022	10.10.2022	10.10.2022	12.09.2022	19.09.2022	26.09.2022	19.09.2022	01.09.2022
Last Working day of ODD Semester				11.02.2023	11.02.2023	11.02.2023	28.01.2023	27.01.2023	31.12.2022	31.12.2022	07.01.2023	31.12.2022	20.12.2022
Practical Examination				13.02.2023 To 21.02.2023	13.02.2023 To 21.02.2023	13.02.2023 To 21.02.2023	01.02.2023 To 09.02.2023	30.01.2023 To 09.02.2023	03.01.2023 To 13.01.2023	03.01.2023 To 13.01.2023	09.01.2023 To 14.01.2023	03.01.2023 To 13.01.2023	21.12.2022 To 31.12.2022
Theory Examinations				22.02.2023 To 22.03.2023	22.02.2023 To 22.03.2023	22.02.2023 To 22.03.2023	13.02.2023 To 03.03.2023	13.02.2023 To 18.03.2023	16.01.2023 To 15.02.2023	16.01.2023 To 15.02.2023	16.01.2023 To 15.02.2023	16.01.2023 To 15.02.2023	---
Internship			*	26.03.2023 To 16.04.2023	---	---		---	---		---		---
Internship Viva Voce/ Project viva				---	---	---		---	---	---	---		---
Commencement of EVEN Semester				17.04.2023	17.04.2023	17.04.2023	20.03.2023	20.03.2023	20.03.2023	20.02.2023	20.02.2023	20.02.2023	06.01.2023

Please Note:

- The academic sessions for ODD semesters should commence from the dates mentioned above. # Commencement of Induction Program As per AICTE Academic Calendar 2022-23
- The commencement date of VII semester B.E./B.Tech/, is postponed from 12.09.2022 to 19.09.2022 to cover 04 weeks of Internship duration. The students of B.E./B.Tech., compulsorily have to complete the Internship in this duration only.
- The commencement date of VII semester B.Plan., is postponed from 12.09.2022 to 26.09.2022 to cover 06 weeks of Internship duration.
- Students joining to VII semester B.E./B.Tech/B.Plan should complete the Internship before the commencement of the classes.
- The Institute needs to function for six days a week with additional hours (Saturday is a full working day). #if required, the college can also plan to have extra classes on Sundays to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University Examinations will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar may be modified based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Academic Calendar is also applicable for Autonomous Colleges. If any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- The college has to conduct offline classes to cover 80% of the syllabus of the courses; however, 20% of the syllabus can be covered in virtual model (Online) mode. Attendance of the students for offline and online classes is mandatory and records should be maintained and submitted to the university whenever informed.
- If any clarification/correction, please email to to-sbhvtuso@gmail.com

* Internship for Lateral Entry Students

Ray 03/09/2022
REGISTRAR
23/9/22



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (Odd SEM)

SEPTEMBER 2022		OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEB 2023			
DAY	Date	EVENT	Dat	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
WED					2						1	3 rd sem –III CIE	
THU	1				3		1				2		
FRI	2				4		2				3		
SAT	3		1		5		3				4		
SUN	4		2		6		4		1		5		
MON	5		3		7		5		2	3 rd -II CIE 7 th sem vtu practical exam starts	6		
TUE	6		4	Ayudha pooja	8		6		3		7		
WED	7		5	Vijaya dashami	9		7		4		8		
THU	8		6		10		8		5		9		
FRI	9		7		11	Kanakadasa Jayanthi	9		6		10		
SAT	10	2 nd Saturday holiday	8	2 nd Saturday holiday	12	2 nd Saturday holiday	10	2 nd Saturday holiday	7		11	3 rd Sem LWD 2 nd Saturday holiday	
SUN	11		9		13		11		8		12		
MON	12		10	START OF 5 TH SEM / START OF I SEM	14	5 th I CIE	12	5 th sem II CIE	9		13	5 th sem theory exam 3 rd sem practical exam	
TUE	13		11		15		13		10	14			
WED	14		12		16		14		11	15			
THU	15		13		17		15		12	16			
FRI	16		14		18		16		13		17		
SAT	17		15		19		17		14	2 nd Saturday holiday	18		
SUN	18		16		20		18		15	Makara Sankranthi	19		
MON	19	START OF 7 TH SEMESTER	17	7 th sem-I CIE	21	7 th sem-II CIE	19	7 th sem-III CIE	16	7 th sem vtu theory 5 th sem III CIE	20		
TUE	20		18		22		20		17	5 th sem III CIE	21		
WED	21		19		23		21		18	5 th sem III CIE	22	3 rd sem theory exam	
THU	22		20		24		22		19		23		
FRI	23		21		25		23		20		24		
SAT	24	4 th Saturday holiday	22	4 th Saturday holiday	26	4 th Saturday holiday	24	4 th Saturday holiday	21		25	4 th Saturday holiday	
SUN	25		23		27		25	Christmas	22		26		
MON	26		24	Naraka chaturdashi	28	3 rd sem-I CIE	26		23		27		
TUE	27		25		29		27	24		24		28	
WED	28		26	Balipadyami	30		28	25		25			
THU	29		27				29		26	Republic Day		 PRINCIPAL CITY ENGINEERING COLLEGE Kanakapura Main Road, BANGALORE - 560 061	
FRI	30		28				30		27	5 th sem LWD			
SAT			29				31	7 th sem LWD	28	4 th Saturday holiday			
SUN			30						29				
MON			31	START OF 3 rd SEMESTER					30	5 th sem exam –practical exam			
TUE			1/11	Rajyotsava					31				



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (Odd SEM)

DEPT OF E&CE

SEPTEMBER 2022		OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEB 2023		
DAY	Date	EVENT	Dat	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
WED					2						1	3 rd sem –III CIE
THU	1				3		1				2	
FRI	2				4	PCB WORKSHOP	2				3	
SAT	3		1		5		3				4	
SUN	4		2		6		4		1		5	
MON	5		3		7		5		2	3 rd -II CIE 7 th sem vtu practical exam starts	6	
TUE	6		4	Ayudha pooja	8		6		3		7	
WED	7		5	Vijaya dashami	9		7	INDUSTRIAL VISIT	4		8	
THU	8		6		10		8		5		9	
FRI	9		7		11	Kanakadasa Jayanthi	9		6		10	
SAT	10	2 nd Saturday holiday	8	2 nd Saturday holiday	12	2 nd Saturday holiday	10	2 nd Saturday holiday	7		11	3 rd Sem LWD 2 nd Saturday holiday
SUN	11		9		13		11		8		12	
MON	12		10	START OF 5 th SEM / START OF I SEM	14	5 th I CIE	12	5 th sem II CIE	9		13	5 th sem theory exam 3 rd sem practical exam
TUE	13		11		15		13		10	14		
WED	14		12		16		14		11	15		
THU	15		13	GUEST LECTURE 1	17		15		12		16	
FRI	16		14		18	GUEST LECTURE 2	16		13		17	
SAT	17		15		19		17		14	2 nd Saturday holiday	18	
SUN	18		16		20		18		15	Makara Sankranthi	19	
MON	19	START OF 7 th SEMESTER	17	7 th sem-I CIE	21	7 th sem-II CIE	19	7 th sem-III CIE	16	7 th sem vtu theory 5 th sem III CIE	20	
TUE	20		18		22		20		17	21		
WED	21		19		23		21		18	22	3 rd sem theory exam	
THU	22		20		24		22		19		23	
FRI	23		21		25		23		20		24	
SAT	24	4 th Saturday holiday	22	4 th Saturday holiday	26	4 th Saturday holiday	24	4 th Saturday holiday	21		25	4 th Saturday holiday
SUN	25		23		27		25	Christmas	22		26	
MON	26		24	Naraka chaturdashi	28	3 rd sem-I CIE	26		23		27	
TUE	27		25		29		27	24		28		
WED	28		26	Balipadyami	30		28	25				
THU	29		27				29		26	Republic Day		
FRI	30		28				30		27	5 th sem LWD		
SAT			29				31	7 th sem LWD	28	4 th Saturday holiday		
SUN			30						29			
MON			31	START OF 3 rd SEMESTER					30	5 th sem exam –practical exam		
TUE			1/11	Rajyotsava					31			

G.S. malikarjuna


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061



CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi
Doddakallasandra, Off Kanakapura Main Road,
Next to Gokulam Apartment, Bangalore - 560 062.



Department of Electronics and Communication Engineering

COURSE ALLOCATION

ACY:2022-23 (odd)

Sl. No	Name of the Faculty	Course code and Name	Year & Sem	Sign
1	Dr. Shalini Prasad	18EC53 - Principles of comm systems 18EC741 - JOTA Wireless sensor networks 18ECP78 - Project work Phase-1	III/5th IV/7th IV/8th	
2	Dr. Ravindra. S	21EC33 - Basic signal processing 18EC52 - Digital signal processing	III/3rd III/5th	R
3	Mr. G.S. Mallikarjuna	18EC752 - open elective - python BE%CK104C - Introduction to E-commerce	III/7th II/5th	
4	Mrs. Shylaja.k	21EC34 - AEC ; LD lab 21ECL381 18EC51 - TIME 18EC76 - Computer n/w lab	II/3rd III/5th	g
5	Mrs. Madhavi J Kulkarni	-	-	-
6	Mr. Gopikishan. J	18ECT1 - computer networks	IV/7th	
7	Mr. Vishva Kiran R.C	18EC56 - Verilog HDL 21ECL32 - DSD using verilog	III/5th II/3rd	V
8	Mrs. Sravanthi R Ravi	21ECL35 - Sravanthi R. Ravi Ag lab 18ECT32 - RTS	II/3rd IV/7th	
9	Mr. SKL Narayana	18EC55 - Sankarishnalakshmi N. Electromagnetic waves 18ECP78 - Project work Phase-1	III/5th IV/9th	SKL



PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061



Professor & Head
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061
Department of Electronics & Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bangalore-560 061.

(1)



CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi
Doddakallasandra, Off Kanakapura Main Road,
Next to Gokulam Apartment, Bangalore - 560 062.



Department of Electronics and Communication Engineering

COURSE PREFERENCE

ACY:2023-24 (odd)

Name of the Faculty: Dr. Ravindra. S

Designation: Professor.

Sl.No	Course code and name	Year/Semester
1	Electro magnetic wave 21EL54	2023 / 5 th
2.	Basic Electronics BESCK201	2023 / 1 st
3.	Computer network. 18EC71	2023 / 7 th
4.	Projectwork, 18ECP78.	2023 / 7 th

Ravindra.S
Faculty

R. S. Ravindra
HOD, ECE
Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bangalore-560 061.

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ODD 2022-2023 TIME TABLE

SEMESTER: III EC CBCS

2021 SCHEME

CLASS ROOM:A107

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:15 AM 10:10 AM	10:10AM 11:05 AM	11:05 AM 11:20 AM	11:20 AM 12:15 PM	12:15 PM 1:10 PM	1:10 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:30 PM
MON	21EC33	21EC32	B R E A K	21MAT31	TUT	L U N C H	Tutorial		
TUE	21EC34	21EC33		21EC32	TUT		21ECL35----- AI		
WED	21EC32	21EC32		21MAT31	SCR		21EC381----- AI		
THU	21EC33	21KAK39		21EC32	21EC34		Tutorial		
FRI	21EC34	21EC33		21MAT31	21EC33		Tutorial		
SAT	NSS/YOGA/ SPORTS			NSS/YOGA/ SPORTS					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18MAT31	Engineering Mathematics -III*	Prof. Gayathri P
18EC32	Digital System Design using Verilog	Prof. Vishva Kiran RC
18EC33	Basic Signal Processing	Prof. Ravindra.S
18EC34	Analog Electronic Circuits	Prof. Shylaja K
18ECL35	Analog and Digital Electronics Lab	AI Prof. Shravanthi K Ravi
21UH36	Social Connect and Responsibility	Prof. Manjunath (civil)
18ECL381	LD (Logic Design) Lab using Pspice / MultiSIM	AI Prof. Shylaja K
21KSK37/47	Kannada	Prof. Deepa

TIMETABLE Co-ordinator

HOD, Dept. of E&CE

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanasiguda Main Road, BANGALORE - 560 051

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD 2022-2023 TIME TABLE

SEMESTER: V EC CBCS

2018 SCHEME

CLASS ROOM:A106

DAY	1	2	TEA	3	4	LUNCH	5	6	7	
	9:15 AM 10:10 AM	10:10AM 11:05 AM	11:05 AM 11:20 AM	11:20 AM 12:15 PM	12:15 PM 1:10 PM	1:10 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:30 PM	
MON	18EC53	18EC54	B R E A K	18ES51	18EC55	L U N C H	18ECL57 ----- AI			
TUE	18EC53	18EC56		18EC54	18EC52		18ECL58 ----- AI			
WED	18EC52	18EC55		Tutorial						
THU	18EC56	18ES51		18EC52	18EC53		18EC52	ENV		
FRI	18EC55	18EC56		18EC53	18ES51		Tutorial			
SAT	ACTIVITY/PROJECT/ INTERNSHIP			ACTIVITY/PROJECT/ INTERNSHIP						

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18ES51	Technological Innovation Management And Entrepreneurship	Prof. Shylaja K
18EC52	Digital Signal Processing	Prof. Ravindra.S
18EC53	Principles of Communication Systems	Prof. Shalini Prasad
18EC54	Information Theory & Coding	Prof. Krishna K S
18EC55	Electromagnetic Waves	Prof. Sai KrishnaLakshmi N
18EC56	Verilog HDL	Prof. Vishva Kiran RC
18ECL57	Digital Signal Processing Laboratory	AI Prof. Ravindra.S
18ECL58	HDL Laboratory	AI Prof. Krishna K S
18CIV59	Environmental Studies	Prof. Vinay

TIMETABLE Co-ordinator

HOD, Dept. of E&CE


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 051

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD 2022-2023 TIME TABLE

SEMESTER: VII EC 'A' SEC CBCS

2018 SCHEME

CLASS ROOM:A105

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:15 AM 10:10 AM	10:10AM 11:05 AM	11:05 AM 11:20 AM	11:20 AM 12:15 PM	12:15 PM 1:10 PM	1:10 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:30 PM
MON	18EC732	18EC72	B R E A K	18EC741	IUT	L U N C H	18ECL76 ----- AI		
TUE	18CS752	18EC71		18EC732	IUT		18ECL77 ----- AI		
WED	18EC741	18EC71		18EC72	IUT		Tutorial	Tutorial	Tutorial
THU	18EC72	18EC732		18CS752	IUT		Project Phase 1		
FRI	18EC741	18CS752		18EC71	IUT		Project Phase 1		
SAT	ACTIVITY/PROJECT/ INTERNSHIP			ACTIVITY/PROJECT/ INTERNSHIP					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18EC71	Computer Networks	Prof. Gopikishan J
18EC72	VLSI Design	Prof. Sai KrishnaLakshmi N
18EC732	Real Time Systems	Prof. Shravanthi K Ravi
18EC741	IOT & Wireless Sensor Networks	Prof. Shalini Prasad
18XX752	Open Elective -B	Prof. Mallikarjuna.G.S
18ECL76	Computer Networks Lab	AI Prof. Shylaja K
18ECL77	VLSI Laboratory	AI Prof. Sai KrishnaLakshmi N
18ECP78	Project Work Phase - 1	Prof. Shalini ,Prof. SKLN



TIMETABLE Co-ordinator



HOD, Dept. of E&CE



PRINCIPAL
CITY ENGINEERING COLLEGE
Sanavepura Main Road, BANGALORE - 520 051



CITY
ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING



COURSE FILE

NAME	DR SHALINI PRASAD .
DESIGNATION	ASSOCIATE PROFESSOR .
SEMESTER	V
SECTION	A
SUBJECT NAME/CODE	PRINCIPLES OF COMMUNICATION. 18EC53
ACADEMIC YEAR	2022 - 2023.



CITY
ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

CONTENTS

1.	COLLEGE CALENDER OF EVENTS								
2.	DEPARTMENT CALENDER OF EVENTS								
3.	CLASS TIME TABLE AND INDIVISUAL TIME TABLE								
4.	UNIVERSITY SYLLABUS								
5.	LESSON PLAN								
6.	STUDENT LIST								
7.	RECORD OF CLASS WORK (SECTION WISE)								
8.	UNIVERSITY QUESTION PAPERS								
9.	MODULE WISE QUESTION BANK								
10.	ASSIGNMENT QUESTIONS								
11.	NEW TEACHING LEARNING INITIATIVES								
12.	REMIIDIAL/TUTORIAL CLASSES CONDUCTED ,IF APPLICABLE								
13.	CONTINUOUS INTERNAL EVALUATION(CIE):								
	<table border="1"><tr><td>13.1</td><td>ATTENDANCE SHORTAGE LIST</td></tr><tr><td>13.2</td><td>CIE QUESTION PAPER AND SCHEME</td></tr><tr><td>13.3</td><td>TOPPERS LIST AND BELOW AVERAGE STUDENT LIST</td></tr><tr><td>13.4</td><td>COUNSELING FORM</td></tr></table>	13.1	ATTENDANCE SHORTAGE LIST	13.2	CIE QUESTION PAPER AND SCHEME	13.3	TOPPERS LIST AND BELOW AVERAGE STUDENT LIST	13.4	COUNSELING FORM
13.1	ATTENDANCE SHORTAGE LIST								
13.2	CIE QUESTION PAPER AND SCHEME								
13.3	TOPPERS LIST AND BELOW AVERAGE STUDENT LIST								
13.4	COUNSELING FORM								
14.	RESULT ANALYSIS AND FEEDBACK								
	<table border="1"><tr><td>14.1</td><td>FINAL CIE MARKS LIST (UNIVERSITY COPY)</td></tr><tr><td>14.2</td><td>SUBJECT RESULT AND STUDENT FEEDBACK</td></tr></table>	14.1	FINAL CIE MARKS LIST (UNIVERSITY COPY)	14.2	SUBJECT RESULT AND STUDENT FEEDBACK				
14.1	FINAL CIE MARKS LIST (UNIVERSITY COPY)								
14.2	SUBJECT RESULT AND STUDENT FEEDBACK								



CITY
ENGINEERING COLLEGE

VISION

Making Remarkable Contribution by Disseminating Knowledge on Emerging Trends in Engineering and Technology through various Programmes, Innovation and Research so as to Excel in Quality both at National and International level and to provide Career Guidance & Training for Employment.

MISSION

M1- To encourage Knowledge Acquisition and Foster Innovation & Research.

M2- To Prepare Students for Immediate Employment, leading to Technological and Socio- economical growth.

M3- To Provide Guidance for a Productive Career under various programmes.



CITY
ENGINEERING COLLEGE

PROGRAM OUTCOMES (PO)

- PO1 – Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2 – Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3 – Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4 – Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5 – Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO6 – The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7 – Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8 – Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9 – Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10 – Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11 – Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12 – Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcome

Electronics & Communication Engineering: Analyze and Design analog & digital circuits or systems. Implement functional blocks of hardware-software co-designs for signal processing and communication applications.

Work with respect for societal values and concern for environment in implementing engineering solutions.



CITY
ENGINEERING COLLEGE

DEPARTMENT VISION AND MISSION

VISION:

To produce Class Engineers for converting global challenges into Opportunities through Value Embedded Quality Education in Electronics & Communication Engineering.

MISSION:

M1: To achieve Academic Excellence in Electronics and Communication Engineering through Teaching, Innovation and Research.

M2: To enable students to develop into outstanding professionals with high Quality standards to face the emerging challenges of the next millennium.

M3: To provide career Guidance and Placement Opportunities in the Core and allied areas

PROGRAM EDUCATION OBJECTIVES (PEO)

After the graduation, the students will have the ability to:

PEO1: Analyze, design and implement solutions in Electronics and Communication Engineering and to adapt for the changes in technology through innovative learning.

PEO2: To Impart professionalism through Industry Projects and Internships.

PEO3: Work with respect for societal values and concern for environment in implementing engineering solutions.

PROGRAM SPECIFIC OUTCOME (PSO)

Analyze and Design analog & digital circuits or systems. Implement functional blocks of hardware-software co-designs for signal processing and communication applications.

Work with respect for societal values and concern for environment in implementing engineering solutions.



CITY
ENGINEERING COLLEGE

DEPARTMENT VISION AND MISSION

VISION:

To produce Class Engineers for converting global challenges into Opportunities through Value Embedded Quality Education in Electronics & Communication Engineering.

MISSION:

M1: To achieve Academic Excellence in Electronics and Communication Engineering through Teaching, Innovation and Research.

M2: To enable students to develop into outstanding professionals with high Quality standards to face the emerging challenges of the next millennium.

M3: To provide career Guidance and Placement Opportunities in the Core and allied areas

PROGRAM EDUCATION OBJECTIVES (PEO)

After the graduation, the students will have the ability to:

PEO1: Analyze, design and implement solutions in Electronics and Communication Engineering and to adapt for the changes in technology through innovative learning.

PEO2: To Impart professionalism through Industry Projects and Internships.

PEO3: Work with respect for societal values and concern for environment in implementing engineering solutions.

PROGRAM SPECIFIC OUTCOME (PSO)

Analyze and Design analog & digital circuits or systems. Implement functional blocks of hardware-software co-designs for signal processing and communication applications.

Work with respect for societal values and concern for environment in implementing engineering solutions.



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (Odd SEM)

SEPTEMBER 2022		OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEB 2023			
DAY	Date	EVENT	Dat	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
WED					2						1	3 rd sem –III CIE	
THU	1				3		1				2		
FRI	2				4		2				3		
SAT	3		1		5		3				4		
SUN	4		2		6		4		1		5		
MON	5		3		7		5		2	3 rd -II CIE 7 th sem vtu practical exam starts	6		
TUE	6		4	Ayudha pooja	8		6		3		7		
WED	7		5	Vijaya dashami	9		7		4		8		
THU	8		6		10		8		5		9		
FRI	9		7		11	Kanakadasa Jayanthi	9		6		10		
SAT	10	2 nd Saturday holiday	8	2 nd Saturday holiday	12	2 nd Saturday holiday	10	2 nd Saturday holiday	7		11	3 rd Sem LWD 2 nd Saturday holiday	
SUN	11		9		13		11		8		12		
MON	12		10	START OF 5 TH SEM / START OF I SEM	14	5 th I CIE	12	5 th sem II CIE	9		13	5 th sem theory exam 3 rd sem practical exam	
TUE	13		11		15		13		10	14			
WED	14		12		16		14		11	15			
THU	15		13		17		15		12	16			
FRI	16		14		18		16		13		17		
SAT	17		15		19		17		14	2 nd Saturday holiday	18		
SUN	18		16		20		18		15	Makara Sankranthi	19		
MON	19	START OF 7 TH SEMESTER	17	7 th sem-I CIE	21	7 th sem-II CIE	19	7 th sem-III CIE	16	7 th sem vtu theory 5 th sem III CIE	20		
TUE	20		18		22		20		17	5 th sem III CIE	21		
WED	21		19		23		21		18	5 th sem III CIE	22	3 rd sem theory exam	
THU	22		20		24		22		19		23		
FRI	23		21		25		23		20		24		
SAT	24	4 th Saturday holiday	22	4 th Saturday holiday	26	4 th Saturday holiday	24	4 th Saturday holiday	21		25	4 th Saturday holiday	
SUN	25		23		27		25	Christmas	22		26		
MON	26		24	Naraka chaturdashi	28	3 rd sem-I CIE	26		23		27		
TUE	27		25		29		27	24		24		28	
WED	28		26	Balipadyami	30		28	25		25			
THU	29		27				29		26	Republic Day			
FRI	30		28				30		27	5 th sem LWD			
SAT			29				31	7 th sem LWD	28	4 th Saturday holiday			
SUN			30						29				
MON			31	START OF 3 rd SEMESTER					30	5 th sem exam –practical exam			
TUE			1/11	Rajyotsava					31				


 PRINCIPAL
 CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061



CITY ENGINEERING COLLEGE 5A EC

Dept. of E&CE

A106

	1 9:00 10:00	2 10:00 11:00	TEA BREAK 11:00 11:15	3 11:15 12:15	4 12:15 13:15	LUNCH 13:15 14:00	5 14:00 15:00	6 15:00 16:00	7 16:00 17:00	
Monday	18EC53 Shalini	18EC54 KSK	TEA	18ES51 Shylaja	18EC55 SKLN	LUNCH	18ECL57 Ravi			
Tuesday	18EC53 Shalini	18EC56 VK		18EC54 KSK	18EC52 Ravi		18ECL58 KSK			
Wednesday	18EC52 Ravi	18EC55 SKLN		18EC54 KSK	18EC53 Shalini		TUT			
Thursday	18EC56 VK	18ES51 Shylaja		18EC52 Ravi	18EC53 Shalini		18EC52 Ravi	ENV		
Friday	18EC55 SKLN	18EC56 VK		18EC53 Shalini	18ES51 Shylaja		TUT			
Saturday	ACTIVITY PROJECT INTERNSHIP			ACTIVITY PROJECT INTERNSHIP						

Timetable generated:02-09-2022

Professor & Head
 Dept. of Electronics &
 Communication Engineering
 City Engineering College,
 Doddaballapur, Kanakapura Main Road,
 Bangalore-560 061.

PRINCIPAL
CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061



CITY ENGINEERING COLLEGE

Dr. Shalini Prasad

Dept. of E&CE

	1 9:00 - 10:00	2 10:00 - 11:00	TEA BREAK 11:00 - 11:15	3 11:15 - 12:15	4 12:15 - 13:15	LUNCH 13:15 - 14:00	5 14:00 - 15:00	6 15:00 - 16:00	7 16:00 - 17:00	
Monday	PCS 5A EC		TEA	IOT 7A EC		LUNCH				
Tuesday	PCS 5A EC									
Wednesday	IOT 7A EC	B. ESC 1F C-CYC			PCS 5A EC					
Thursday	B. ESC 1F C-CYC				PCS 5A EC					
Friday	IOT 7A EC	B. ESC 1F C-CYC			PCS 5A EC					
Saturday										

Timetable generated:02-09-2022

A.S. Mallick
 Professor & Head
 Dept. of Electronics &
 Communication Engineering
 City Engineering College,
 Doddaballapur, Kanakapura Main Road,
 Bangalore-560 061.

Dr. Shalini Prasad
 PRINCIPAL
CITY ENGINEERING COLLEGE
 Kanakapura Main Road, BANGALORE - 560 061

PRINCIPLES OF COMMUNICATION SYSTEMS

Course Code	: 18EC53	CIE Marks : 40
Lecture Hours/Week	: 03 + 2 (Tutorial)	SEE marks : 60
Total Number of Lecture Hours	: 50 (10 Hrs / Module)	Exam Hours : 03
CREDITS : 04		

Course Learning Objectives: This course will enable students to

- Understand and analyse concepts of Analog Modulation schemes viz; AM, FM, Low pass sampling and Quantization as a random process.
- Understand and analyse concepts digitization of signals viz; sampling, quantizing and encoding.
- Evolve the concept of SNR in the presence of channel induced noise and study Demodulation of analog modulated signals.
- Evolve the concept of quantization noise for sampled and encoded signals and study the concepts of reconstruction from these samples at a receiver.

Module-1

AMPLITUDE MODULATION: Introduction, Amplitude Modulation: Time & Frequency Domain description, Switching modulator, Envelop detector. (3.1 – 3.2 in Text)

DOUBLE SIDE BAND-SUPPRESSED CARRIER MODULATION: Time and Frequency Domain description, Ring modulator, Coherent detection, Costas Receiver, Quadrature Carrier Multiplexing. (3.3 – 3.4 in Text)

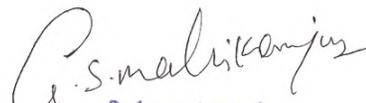
SINGLE SIDE-BAND AND VESTIGIAL SIDEBAND METHODS OF MODULATION: SSB Modulation, VSB Modulation, Frequency Translation, Frequency- Division Multiplexing, Theme Example: VSB Transmission of Analog and Digital Television. (3.5 – 3.8 in Text)

L1, L2, L3

Module-2

ANGLE MODULATION: Basic definitions, Frequency Modulation: Narrow Band FM, Wide Band FM, Transmission bandwidth of FM Signals, Generation of FM Signals, Demodulation of FM Signals, FM Stereo Multiplexing, Phase-Locked Loop: Nonlinear model of PLL, Linear model of PLL, Nonlinear Effects in FM Systems. The Superheterodyne Receiver (4.1 – 4.6 of Text)

L1, L2, L3


Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Ondolakkalasaandra, Kanakapura Main Road,
Bangalore-560 061.

Module-3

[Review of Mean, Correlation and Covariance functions of Random Processes.
(No questions to be set on these topics)]

NOISE - Shot Noise, Thermal noise, White Noise, Noise Equivalent Bandwidth
(5.10 in Text)

NOISE IN ANALOG MODULATION: Introduction, Receiver Model, Noise in DSB-SC receivers, Noise in AM receivers, Threshold effect, Noise in FM receivers, Capture effect, FM threshold effect, FM threshold reduction, Pre-emphasis and De-emphasis in FM (6.1 – 6.6 in Text)

L1,L2,L3

Module-4

SAMPLING AND QUANTIZATION: Introduction, Why Digitize Analog Sources?, The Low pass Sampling process Pulse Amplitude Modulation, Time Division Multiplexing, Pulse-Position Modulation, Generation of PPM Waves, Detection of PPM Waves.(7.1 – 7.7 in Text)

L1,L2,L3

Module-5

SAMPLING AND QUANTIZATION (Contd): The Quantization Random Process, Quantization Noise, Pulse-Code Modulation: Sampling, Quantization, Encoding, Regeneration, Decoding, Filtering, Multiplexing; Delta Modulation (7.8 – 7.10 in Text),
Application examples - (a) Video + MPEG (7.11 in Text) and (b) Vocoders (refer Section 6.8 of Reference Book 1).

L1,L2,L3

Course Outcomes: After studying this course, students will be able to:

1. Analyze and compute performance of AM and FM modulation in the presence of noise at the receiver.
2. Analyze and compute performance of digital formatting processes with quantization noise.
3. Multiplex digitally formatted signals at Transmitter.
4. Demultiplex the signals and reconstruct digitally formatted signals at the receiver.
5. Design /Demonstrate the use of digital formatting in Multiplexers, Vocoders and Video transmission.

Question paper pattern:

- Examination will be conducted for 100 marks with question paper containing 10 full questions, each of 20 marks.
- Each full question can have a maximum of 4 sub questions.
- There will be 2 full questions from each module covering all the topics of the module.



Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Ondakalleshandra, Kanakapura Main Road,
Bangalore-560 061.



DEPARTMENT OF E&C
LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2018

Course Title: PRINCIPLES OF COMMUNICATION SYSTEMS	Course Code : 18EC53
Total contact hours: L:T:P:S :: 5:1:0:1	End Term Marks : 60
Internal Marks : 40	
Semester : V	Academic year : 2022
Lesson plan Author: Shalini Prasad	Date : 10/10 /2022

Course Objective:

This course will enable students to:

- Understand and analyze concepts of Analog Modulation schemes viz; AM, FM., Low pass sampling and Quantization as a random process.
- Understand and analyze concepts digitization of signals viz; sampling, quantizing and encoding.
- Evolve the concept of SNR in the presence of channel induced noise and study Demodulation of analog modulated signals.
- Evolve the concept of quantization noise for sampled and encoded signals and study the concepts of reconstruction from these samples at a receiver.

Course Outcomes:

After studying this course, students will be able to:

- Analyze and compute performance of AM and FM modulation in the presence of noise at the receiver.
- Analyze and compute performance of digital formatting processes with quantization noise.
- Multiplex digitally formatted signals at Transmitter and demultiplex the signals and reconstruct digitally formatted signals at the receiver.
- Design/Demonstrate the use of digital formatting in Multiplexers, Vocoders and Video transmission.

MODULE1

Week	Days/Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Introduction, AM: Time & Frequency Domain description	R,U	CO1
	2	Switching modulator, Envelop detector.	R,U	CO1
	3	DOUBLE SIDE BAND-SUPPRESSED CARRIER MODULATION: Time and Frequency Domain description,.	R,U	CO1
	4	Problems	R,U,A	CO1
	5	Ring modulator, Coherent detection,.	R,U	CO1

Professor & Head
 Dept. of Electronics & Communication Engineering
 City Engineering College,
 Doddakalasangra, Kanakapura Main Road,
 Bangalore 560 061.

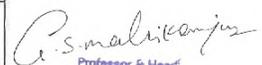
2	1	Costas Receiver, Quadrature Carrier Multiplexing.	R,U	CO1
	2	SINGLE SIDE-BAND AND VESTIGIAL SIDEBAND METHODS OF MODULATION: SSB Modulation,	R,U,	CO1
	3	VSB Modulation,	R,U	CO1
	4	Frequency Translation,	R,U	CO1
	5	Frequency- Division Multiplexing,	R,U	CO1
3	1	Example: VSB Transmission of Analog and Digital Television.	R,U	CO1
	2	Revision	R,U	CO1
	3	Problems	R,U,A	CO1
	4	Problems	R,U,A	CO1
	5	Problems	R,U,A	CO1

MODULE2

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
4	1	ANGLE MODULATION: Basic definitions	R,U	C01
	2	Frequency Modulation: Narrow Band FM	R,U	C01
	3	Wide Band FM, Transmission bandwidth of FM Signals,	R,U	C01
	4	generation of FM waves: FM	R,U,A1	CO1
	5	Demodulation of FM waves	R,U,A1	CO1
5	1	FM Stereo Multiplexing	R,U,A1	CO1
	2	Phase-locked loop,	R,U,A1	CO1
	3	Nonlinear model of the phase – locked loop,	R,U	CO1
	4	Linear model of the phase – locked loop	R,U	CO1
	5	Super heterodyne Receiver. Nonlinear effects of FM systems	R,U	CO1

MODULE3

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
6	1	NOISE - Shot Noise,	R, U,	CO1
	2	Thermal noise, White Noise	R, U,	CO1
	3	Noise Equivalent Bandwidth	U, A1,A2	CO1
	4	NOISE IN ANALOG MODULATION: Introduction, Receiver Model,	R, U,	CO1 CO1
	5	Noise in DSB-SC receivers.	R, U,	CO1
7	1	Noise in AM receivers, Threshold effect,	R, U,	CO1
	2	Noise in FM receivers,	R,U	CO1


 Professor & Head
 Dept. of Electronics &
 Communication Engineering
 City Engineering College,
 Doddaballapur, Karnataka, India
 Bangalore 560 081

	3	Capture effect, FM threshold effect, FM threshold reduction,	R, U, A1	CO1
	4	Pre-emphasis and De-emphasis in FM	R,U	CO1
	5	Problems	R,U, A1	CO1

MODULE4

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
8	1	SAMPLING AND QUANTIZATION: Introduction,	R, U	CO2
	2	Why Digitize Analog Sources?	R,U	CO2
	3	The Low pass Sampling process Pulse Amplitude Modulation.	R, U,	CO2, CO3
	4	Time Division Multiplexing,	R, U	CO2, CO3
	5	Problems	R, U, A1,A2	CO2, CO3
9	1	Problems	R, U, A1,A2	CO2, CO3
	2	Pulse-Position Modulation,	R,U,	CO2, CO3
	3	Generation of PPM Waves,	R,U,	CO2, CO3
	4	Detection of PPM Waves.	R,U,	CO2, CO3
	5	Problems	R,U, A1,A2	CO2, CO3

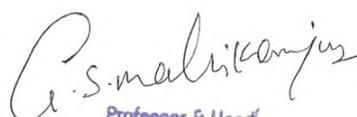
MODULE5

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
10	1	SAMPLING AND QUANTIZATION (Contd): The Quantization Random Process,	R,U	CO2
	2	Quantization Noise,	R,U,A1	CO2,
	3	Pulse-Code Modulation: Sampling,	R,U,A1	CO2,CO3
	4	Quantization, Encoding, Regeneration	R,U	CO2,CO3
	5	Decoding, Filtering,	R,U,A1	CO2,CO3
11	1	Multiplexing; Delta Modulation	R,U,A2	CO2,CO3
	2	Application examples - (a) Video + MPEG	R,U	CO3,CO4
	3	Application examples - Vocoders	R,U	CO3,CO4
	4	Revision	R,U	CO2,CO3
	5	Revision	R,U,A1	CO2,CO3

Bloom's Taxonomy Level

R-Remembering U-Understanding A1-Applying A2-Analysing E-Evaluating C-Creating

Text Books: 1. **Communication Systems**, Simon Haykins & Moher, 5th Edition, John Willey, India Pvt. Ltd, 2010 ISBN 978-81-265-3653-52.


 Professor & Head
 Dept. of Electronics &
 Communication Engineering
 City Engineering College,
 Doddakalasaandra, Kanakapura Main Road
 Bengaluru-560 061.

An Introduction to Analog and digital Communication, SimonHaykins & Moher, John Wiley India Pvt. Ltd., 2012. ISBN 978-81-265-3653-5

Reference Books:

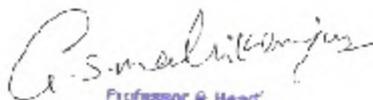
1. **Principles of Communications**, Herbert Taub & D.L.Schilling, TMH, 3rd Edition, 2008.
2. **Modern digital and analog Communication systems**, B. P. Lathi, Oxford University Press., 4th edition 2010.
3. **Communication Systems**, Harold P.E, Stern Samy and A Mahmond, Pearson Edition, 2004 ISBN 81-297-0686-5.
4. **Communication Systems Analog and Digital**, R.P.Singh and S.D.Sapre, TMH 2nd edition, 2007.

List of URLs-Text Books, Notes, Multimedia Content, etc.

- <http://nptel.ac.in/courses/117102059/>
- <http://www.sjbit.edu.in/app/course-material/ECE/V/ANALOG%20COMMUNICATION%20%5B10EC53%5D/ECE-V-ANALOG%20COMMUNICATION%20%5B10EC53%5D-NOTES.pdf>



Signature of Faculty



Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddahallakatte, Kompasuru Main Road
Bengaluru-560 081.

CITY ENGINEERING COLLEGE				
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING				
5TH SEM	ODD 2022-23	STUDENT LIST		
SL. NO.	USN	NAME		
1	1CE20EC001	BHANU CHANDAN K B		
2	1CE20EC002	KEERTHI A		
3	1CE20EC003	SUKRUTH S R		
4	1CE21EC400	MD TOUHEED		
5	1CE21EC401	RAGHU T H		

C. S. Malikarjuna
Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bengaluru-560 061.

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

18EC53

Fifth Semester B.E. Degree Examination, July/August 2022
Principles of Communication Systems

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1. a. Illustrate the time domain and frequency domain characteristics of standard amplitude modulation produced by a single tone. (10 Marks)
 b. Explain switching modulator with circuit diagram and characteristic curve. (10 Marks)

OR

2. a. Explain the generation of DSBSC wave using a Ring modulator. (07 Marks)
 b. Explain the scheme of generation and demodulation of VSB modulated wave with relevant spectrum of signals and mathematical expressions. (07 Marks)
 c. Explain with block diagram of FDM system. (06 Marks)

Module-2

3. a. Explain with block diagram generation of FM wave using PM and PM wave using FM. (07 Marks)
 b. Explain the indirect method of generation FM wave with relevant equation and diagram. (07 Marks)
 c. Explain FM stereo multiplexing. (06 Marks)

OR

4. a. Derive the expression for Linear model of PLL. (08 Marks)
 b. Explain with diagram for superhetrodyne receiver. (08 Marks)
 c. Determine the bandwidth of an FM signal. If the maximum value of the frequency deviation M is fixed at 75KHz for commercial FM broadcasting by radio and modulation frequency is $W = 15$ KHz. Bylearson's rule. (04 Marks)

Module-3

5. a. Derive the expression for figure of merit for DSB-SC receiver. (07 Marks)
 b. Write short notes on:
 i) Shot noise
 ii) Thermal noise
 iii) White noise (06 Marks)
 c. Find figure of merit for single tone AM. (07 Marks)

OR

6. a. With FM receiver model, derive the expression for figure of merit. (07 Marks)
 b. Briefly explain the following as applicable to FM:
 i) Pre-emphasis
 ii) De-emphasis. (06 Marks)
 c. Explain about FM threshold effect and its reduction method. (07 Marks)

1 of 2

Important Note: 1. On completing your answers, compulsorily mark digital cross (X) on the remaining blank pages.
 2. Any revealing of identification, approval number and seat numbers written eg. 12, 8-50, will be treated as malpractice.

18EC53

Module-4

- 7 a. What are the advantages of digital signal over analog signal? (06 Marks)
- b. State sampling theorem and explain same with neat sketches and equation. (07 Marks)
- c. Explain with block diagram for TDM. (07 Marks)

OR

- 8 a. Explain with diagram the generation of PPM waves. (07 Marks)
- b. Explain the detection of PPM waves. (07 Marks)
- c. Explain the following terms : (06 Marks)
 - i) Under sampling
 - ii) Over sampling
 - iii) Nyquist rate.

Module-5

- 9 a. Explain the midtread and midrise related to quantization noise. (06 Marks)
- b. Explain with diagram for pulse-code modulation. (07 Marks)
- c. Explain Delta modulation with transmitter and receiver systems. (07 Marks)

OR

- 10 a. Explain the unipolar NRZ, polar NRZ and Bipolar RZ with an example. (06 Marks)
- b. Write a note on MPEG - Video. (07 Marks)
- c. Explain Linear prediction coding VOCODER. (07 Marks)

* * * * *

C.S. malikamjuz

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Ondolakallasandra, Kanakapura Main Road,
Bengaluru-590 061.

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

18EC53

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021

Principles of Communication System

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.***Module-1**

- 1 a. Explain in detail the working of switching modulator with diagram and necessary derivations. (10 Marks)
- b. Explain the generation of DSBSC modulated waves using ring modulator. (10 Marks)

OR

- 2 a. Illustrate the amplitude modulation process and draw the waveform for modulation index $M = 1$ & $M = 1$. (08 Marks)
- b. Explain with relevant block diagram and working of FDM system. (08 Marks)
- c. A 400 W carrier is modulated to a depth of 75 percent. Calculate the total power in the modulated wave of following form: (04 Marks)
- (i) Double Side Band with Full Carrier (DSBFC)
- (ii) Double Side Band Suppressed Carrier (DSBSC)

Module-2

- 3 a. Derive the equations for frequency modulated wave. Define modulation index and frequency deviation. (12 Marks)
- b. A 93.2 MHz carrier is frequency modulated by 5 kHz sine wave the resultant FM signal has frequency deviation of 40 kHz:
- (i) Find the carrier swing of FM signal
- (ii) What are highest and lowest frequencies of FM signal?
- (iii) Calculate the modulation index of FM
- (iv) B.W of FM signal (08 Marks)

OR

- 4 a. Explain the Narrow band FM with relevant expressions and phasor diagrams. (10 Marks)
- b. Discuss the nonlinear effects in FM system. (06 Marks)
- c. Assume that the maximum value of frequency deviation Δf is fixed at 50 kHz for a certain FM transmission. Given that the maximum modulating frequency is 15 kHz. Calculate the necessary transmission bandwidth. (04 Marks)

Module-3

- 5 a. Derive the expression for figure of merit for DSB-SC receiver. (10 Marks)
- b. Find figure of merit for single tone FM. (06 Marks)
- c. Write short notes on:
- (i) Shot Noise
- (ii) White Noise (04 Marks)

1 of 2

18EC53

OR

- 6 a. With FM receiver model, derive the expression for figure of merit. (10 Marks)
 b. Briefly explain the following as application to FM: (06 Marks)
 (i) Pre-emphasis
 (ii) De-emphasis
 c. An AM receiver operating with a sinusoidal modulating signal has a following specifications: $m = 0.8$ and $(SNR)_c = 30$ dB. What is carrier to noise ratio? (04 Marks)

Module-4

- 7 a. State sampling theorem and explain same with neat sketches and equation. (10 Marks)
 b. With neat block diagram, explain the TDM. (06 Marks)
 c. A Compact Disc (CD) audio signals digitally using PCM. Assume the audio signal bandwidth to be 20 KHz.
 (i) What is the Nyquist rate?
 (ii) If the Nyquist samples are quantized to $L = 65,536$ levels and then binary coded, determine the number of bits required to encode a sample. (04 Marks)

OR

- 8 a. What are advantages digitizing the analog signals? (06 Marks)
 b. With a block diagram, explain the generation and detection of PPM. (10 Marks)
 c. Discuss Bandwidth - Noise trade off. (04 Marks)

Module-5

- 9 a. With a neat diagram, explain the basic elements of a PCM. (08 Marks)
 b. Discuss the concept and operation of delta modulation in detail. (08 Marks)
 c. PCM system uses uniform quantizer followed by a 7 bit binary encoder. The bit rate of the system is 50×10^6 bps. What is minimum message bandwidth? (04 Marks)

OR

- 10 a. Write a note on MPEG - Video. (10 Marks)
 b. Draw the resulting waveform for 01101001 using unipolar NRZ, polar NRZ, unipolar ZRZ, Bipolar RZ. (06 Marks)
 c. A TV signal with a bandwidth of 4.2 MHz is transmitted using binary PCM. The number of representation level is 512. Calculate:
 (i) Codeword length
 (ii) Final bit rate
 (iii) Transmission bandwidth (04 Marks)

A.S. malikarjuna
 Professor & Head
 Dept. of Electronics &
 Communication Engineering
 City Engineering College,
 Doddakallasandra, Kanakapura Main Road,
 Bengaluru-560 061.

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

18EC53

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022

Principles of Communication Systems

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*Module-1

- 1 a. Write an AM wave expression in time domain and in frequency domain. Draw AM waveform. (07 Marks)
- b. With neat diagram, explain the demodulation of AM wave using envelope detector. (08 Marks)
- c. An audio frequency signal $M(t) = 5 \sin 2\pi (10^3)t$ is used to amplitude modulate a carrier of $C(t) = 100 \sin 2\pi (10^6)t$. Assume modulation index $\mu = 0.4$. Find: i) Sideband frequencies ii) Amplitude of each sideband iii) Bandwidth iv) Total power delivered to a load of 100Ω v) Find efficiency of AM wave, assume $R = 1\Omega$. (05 Marks)

OR

- 2 a. Explain the generation of DSBSC wave using a Ring modulator. (10 Marks)
- b. Explain with a neat diagram, the working of Quadrature Carrier Multiplexing (QAM). (08 Marks)
- c. An AM signal with a carrier of 1kW has 200W in each sideband. What is the percentage of modulation? (02 Marks)

Module-2

- 3 a. Define angle modulation. Derive the FM wave expression in time domain. (08 Marks)
- b. Define the following terms:
i) Modulation index
ii) Frequency deviation
iii) Bandwidth (07 Marks)
- c. A FM wave is represented by the equation $V = 10 \sin [5 \times 10^6 t + 4 \sin 1250t]$. Find: i) Carrier frequency and modulating frequency ii) Modulation index and frequency deviation iii) Bandwidth using Carson's rule. (05 Marks)

OR

- 4 a. Write the basic block diagram of PLL. Derive the expression for non-linear model of PLL. (10 Marks)
- b. Explain the direct method of generating FM wave using Hartley oscillator with relevant equations and diagram. (06 Marks)
- c. Write the Narrowband FM and wideband FM expression. (04 Marks)

Module-3

- 5 a. Derive the expression for figure of merit of an AM receivers using envelope detection. (10 Marks)
- b. Explain the noisy receiver model with neat diagram. Explain briefly the figure of merit. (06 Marks)
- c. Explain the noise equivalent bandwidth with relevant equation.

1 of 2

C. S. Malikarjuna
 Professor & Head
 Dept. of Electronics &
 Communication Engineering
 City Engineering College,
 Doddakalleshandra, Kanakapura Main Road,
 Bengaluru-560 061.

18EC53

OR

- 6 a. Derive the expression for Figure Of Merit (FOM) for DSBSC receiver. (10 Marks)
 b. Explain the use of pre-emphasis and de-emphasis circuit in an FM system. (06 Marks)
 c. Define the white noise. Briefly explain the power spectral density and autocorrelation function of white noise. (04 Marks)

Module-4

- 7 a. State sampling theorem. Write the mathematical form of sampled signal and explain the steps to reconstruct the signal $g(t)$ from the sequence of sample value. (10 Marks)
 b. Explain the concept of TDM with a neat block diagram. (06 Marks)
 c. What is aperture effect? Briefly explain how to overcome this effect. (04 Marks)

OR

- 8 a. Briefly explain the following pulse modulation with waveform:
 i) PAM ii) PWM iii) PPM. (09 Marks)
 b. With neat block diagram, explain the generation of PPM wave. (05 Marks)
 c. Explain the following terms:
 i) Under sampling
 ii) Over sampling
 iii) Nyquist rate. (06 Marks)

Module-5

- 9 a. Derive the expression of output signal to noise ratio of a uniform quantizer. (08 Marks)
 b. With neat block diagram, explain the transmitter, transmission path and receiver of a PCM system. (08 Marks)
 c. An audio signal digitalized using PCM. Assume the audio signal bandwidth to be 20kHz.
 i) What is the Nyquist rate and Nyquist period of the audio signal?
 ii) If the samples are quantized to 1000 levels and then binary coded, determine the number of bits required to encode a sample. (04 Marks)

OR

- 10 a. Draw the line codes for given binary representation 01101001
 i) Unipolar NRZ signaling
 ii) Polar NRZ signaling
 iii) Unipolar RZ signaling
 iv) Bipolar RZ signaling
 v) Manchester code. (10 Marks)
 b. Explain granular noise and slope overload distortion in delta modulation. (04 Marks)
 c. With neat diagram explain delta modulation system. (06 Marks)

* * * * *

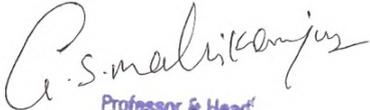
C. S. Malikarjuna

Professor & Head
 Dept. of Electronics &
 Communication Engineering
 City Engineering College,
 Doddakallasaandra, Kanakapura Main Road,
 Bengaluru-560 061.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PCS ASSIGNMENT1

1. Explain the operation of envelope detector with neat diagram and waveforms. Bring out the significance of the RC time constant of the circuit in detection of the message signal without distortion.
2. Explain coherent detection of DSBSC wave with block diagram and spectrum.
3. Define Amplitude modulation. Explain the generation of AM wave using switching modulator.
4. Explain how costas receiver can be used for demodulating the DSB-SC signal.
5. Explain frequency translation.
6. Explain the generation of DSB-SC modulated wave using ring modulator.
7. With relevant block diagram, explain the working of FDM systems.
8. Explain Shot Noise, White Noise and Thermal Noise.
9. Define standard form of amplitude modulation, derive its equation and explain each term. Derive the Spectral equation of AM wave and hence draw and explain the AM spectrum.
10. Explain the need for modulation
11. The antenna current of an AM transmitter is 8amps, when only carrier is sent. But it increases to
12. 8.93amps when the carrier is modulated by a single sine wave . Find the percentage modulation.
13. Determine the antenna current when the percentage modulation changes to 0.8.
14. An audio frequency signal $5 \sin 2\pi 1000t$ is used to amplitude modulate a carrier of $100 \sin 2 \pi 10^6 t$. Assume modulation index is 0.4 .Find a) Sideband frequencies b) Bandwidth required c) amplitude of each side band d) total power delivered to a load of 100 ohm.


Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bengaluru-560 061.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PCS SECOND ASSIGNMENT

1. Explain Shot Noise, White Noise and Thermal Noise.
2. Define Noise Equivalent Bandwidth and Derive the Same.
3. Discuss the noise in DSBSC Receiver with a model receiver using coherent detection. Prove that the figure of merit for such receiver is unity.
4. Explain about FM threshold effect and its reduction method.
5. Why pre-emphasis and de-emphasis are required? Explain how they are implemented.
6. An FM signal with $\Delta f = 75\text{kHz}$ is applied to the FM Demodulator. When channel SNR is 15db, fm is 10kHz. Find output SNR at demodulator.
7. An AM receiver operating with sinusoidal wave of 80% modulation has an output signal to noise ratio of 30 db. Calculate the corresponding channel signal to noise ratio. Prove the formula used.
8. Derive the expression for FOM of an AM Receiver.
9. Derive the expression for FOM for FM Receiver.
10. Find the FOM of an AM receiver when depth of modulation is a)100% b)50% c)30%.
11. Explain the following with respect to FM a) Threshold Effect b) Capture Effect.
12. Derive the time domain expression of frequency modulated wave. Define modulation index, maximum deviation of a frequency modulated signal.
13. Explain the generation of wideband frequency modulated wave by direct method.
14. The equation for a FM wave is $s(t) = 10 \sin[5.7 \times 10^8 t + 5 \sin 12 \times 10^3 t]$. Calculate:
 - i) Carrier frequency
 - ii) Modulating Frequency
 - iii) Modulation index
 - iv) Frequency Deviation
 - v) Power dissipated in 100Ω
15. With relevant block diagram explain FM stereo multiplexing.
16. Explain the linear model of phase locked loop(PLL).


Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bengaluru-560 061.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PCS THIRD ASSIGNMENT

1. A) What are the advantages of digital signal over analog signals.
B) State and prove sampling theorem for band limited signals.
2. Explain the working of TDM system with necessary block diagram.
3. Explain the generation and reconstruction of a PCM signal.
4. What is Quantization noise? Derive the output signal to noise ratio of a uniform quantizer.
5. With neat block diagram, explain the generation of pulse – position modulation (PPM) wave.
6. What is multiplexing. What are different types of multiplexing. Explain TDM with a neat block diagram.
7. What is quantization process. Explain the different types of Quantization with their input output characteristics.
8. Define Pulse Amplitude Modulation. Obtain the expression for the Fourier Transform of PAM signal.
9. Represent the binary data 10011101 in polar NRZ and bipolar RZ formatting.
10. Explain the process of sampling and reconstruction of $x(t)$ from its samples. State sampling theorem.
11. For a sinusoidal modulating signal, show that the signal to quantization noise ratio is $1.8 + 6R$ dB, where R is the number of bits per sample.
12. Write a note on MPEG+ Video.
13. Draw the resulting waveform for 01101001 using unipolar NRZ, polar NRZ, unipolar RZ , bipolar RZ.


Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bengaluru-560 061.

CITY ENGINEERING COLLEGE**FIRST INTERNAL TEST**

Program: Electronics and communication Engineering

Date: 15/11/2022

Course Name: PCS

Time: 10:30AM – 12:00 PM

Sem: V EC

Duration: 1 ½Hrs

MAX MARKS: 50*Note: Answer any FIVE questions choosing at least ONE from each Part.***Part – A**

1.	Explain the operation of envelope detector with neat diagram and waveforms. Bring out the significance of the RC time constant of the circuit in detection of the message signal without distortion.	6	CO1	BT1, BT2,
	Explain coherent detection of DSBSC wave	4		
Or				
2.	Define Amplitude modulation. Explain the generation of AM wave using switching modulator	10	CO1	BT1, BT2

Part – B

3.	Define standard form of amplitude modulation, derive its equation and explain each term. Derive the Spectral equation of AM wave and hence draw and explain the AM spectrum	10	CO1	BT2
Or				
4.	Explain how costas receiver can be used for demodulating the DSB-SC signal.	5	CO1	BT2
	Explain frequency translation.	5	CO1	BT2

Part-C

5.	Explain Shot Noise, White Noise and Thermal Noise.	5	CO1	BT1, BT2, BT3
		5	CO1	
Or				
6.	Explain the generation of DSB-SC modulated wave using ring modulator	10	CO1	BT1, BT2

Part-D

7.	With relevant block diagram, explain the working of FDM systems.	10	CO1	BT1, BT2
Or				
8.	Explain the need for modulation.	10	CO2	BT1, BT2

Part-E

9.	An audio frequency signal $5\sin 2\pi(1000)t$ is used to amplitude modulate a carrier of $100\sin 2\pi(10^6)t$. Assume modulation index of 0.4. Find sideband frequencies, Bandwidth required, amplitude of each side band, total power delivered to the load.	10	CO2	BT3, BT4
Or				
10	The antenna current of an AM transmitter is 8amps, when only carrier is sent. But it increases to 8.93amps when the carrier is modulated by a single sine wave. Find the percentage modulation. Determine the antenna current when the percentage modulation changes to 0.8.	10	CO2	BT1, BT2

Blooms Taxonomy Levels (BTL): BT1-Remembering BT2- Understanding BT3 – Applying BT4 – Analysing

C.S. Mahalingam

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

SCHEME FOR VALUATION

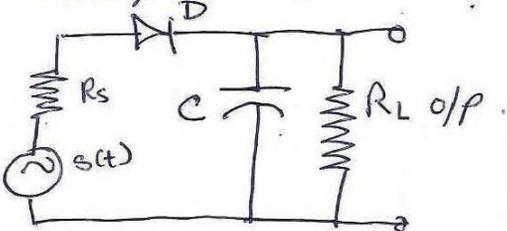
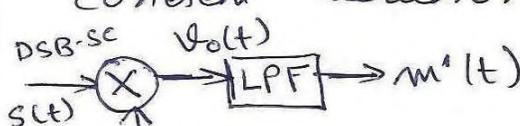
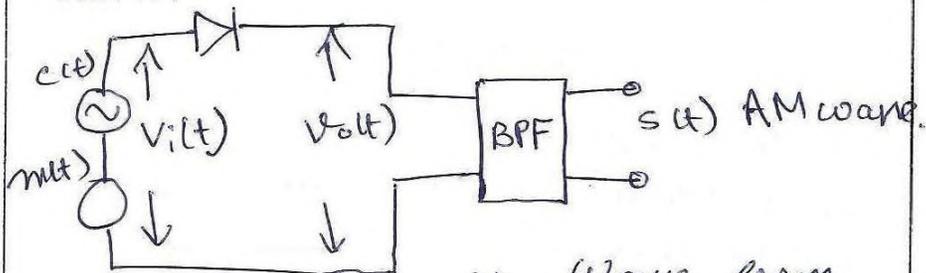
INTERNAL TEST: I

Semester & Section: V A

Sub Code: 18EC53

Sub Name: PCS

Date: 9-11-2021

Question No.	Details of the Answer	Marks Distribution	Total Marks
1a)	<p>Envelope detection</p>  <p>Significance: $R_s C \ll \frac{1}{f_c}$ $\frac{1}{f_c} \ll R_L C \ll \frac{1}{W}$</p>	3 2	5
1b)	<p>Coherent Detection</p>  <p>Explanatory $v_o(t) = s(t) \cos(2\pi f_c t)$ $m'(t) = \frac{A_c m(t)}{2}$</p>	3 2	5 <u>10</u>
2.	<p>Amplitude Modulation Generation Switching Modulator</p>  <p>cbt Diagram + Wave form</p> <p>Derivation</p>	4 4	<u>10</u>

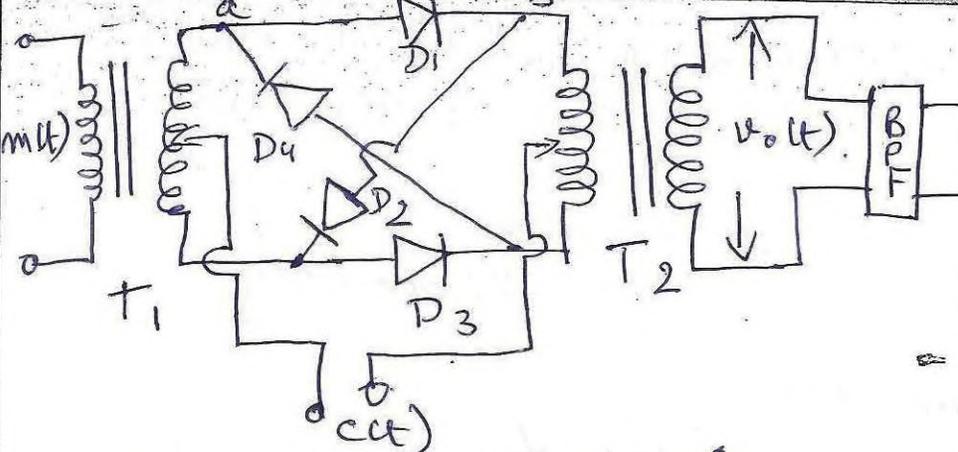
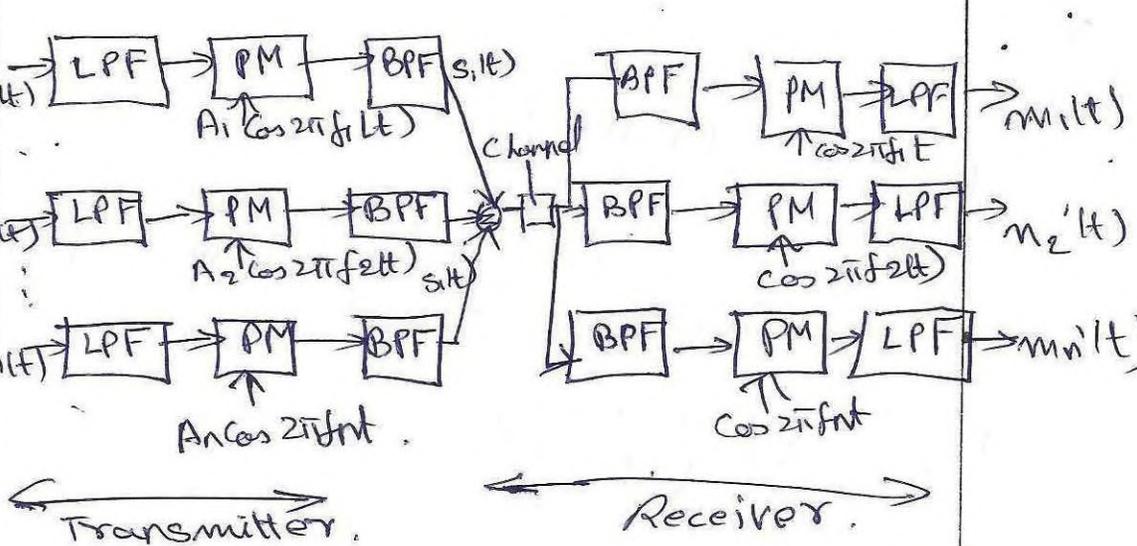
Staff S. Prasad

C.S. Malikanjan
HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
3.	<p>Amplitude Modulation Definition</p> <p>Derivation of time domain and frequency domain terms along with explanation of each term</p> <p>AM spectrum</p>	<p>2.</p> <p>4</p> <p>4</p>	<p>- 10</p>
4a)	<p>Costas Receiver</p> <p>Block diagram with explanation</p>	<p>5.</p>	
b.	<p>Frequency Translation</p> <p>Block Diagram with explanation</p>	<p>5</p>	<p>10</p>
5.	<p>Short Notes on</p> <ul style="list-style-type: none"> Shot Noise White Noise Thermal Noise 	<p>— 3.</p> <p>— 3.</p> <p>— 4</p>	<p>10</p>

Staff *[Signature]*

[Signature]
HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	 <p>Diagram + Explanation Derivation + wave form</p>	5 5	10.
7.	 <p>Block Diagram + Explain</p>	10.	10.
8.	<p>Need for Modulation</p> <ul style="list-style-type: none"> i) Reduce height of antenna ii) Avoid mixing of signal iii) Improve Quality of Reception iv) Allows adjustment in BW. v) Allows Multiplexing of signal. vi) Increases the Range of air 	10.	10.

Staff *J. Prasad*

C.S. Mahalingam
HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
9	$f_{USB} = f_c + f_m = 1\text{MHz} + 1000\text{Hz} = 1.001\text{MHz}$ $f_{LSB} = 1\text{MHz} - 1000\text{Hz} = 0.999\text{MHz}$ <p>ii) Bandwd Required $= 2f_m = 2\text{kHz}$</p> <p>iii) Amplitude of each side Band $\frac{\mu A_c}{2} = \frac{0.4 \times 100}{2} = 20\text{V}$</p> <p>Total Power delivered to Load $P_T = P_C \left[1 + \frac{\mu^2}{2} \right]$ $= \frac{100^2}{2 \times 100} \left[1 + \frac{0.4^2}{2} \right] = 54\text{W}$</p>		10M
10	$I_t = I_c \sqrt{1 + \frac{m^2}{2}}$ $m = \sqrt{2 \left(\frac{I_t}{I_c} \right)^2 - 1} = 70.1\%$ <p>When $m = 0.8$ - $I_t = I_c \sqrt{1 + \frac{0.8^2}{2}}$ $= 9.19\text{Amp}$</p>		10M

Staff

J. Prasad

C.S. Malikarjuna

HOD

CITY ENGINEERING COLLEGE

SECOND INTERNAL TEST

Programme: Electronics and communication Engineering

Date: 13/12/2022

Course Name: PCS

Time: 10:30 – 12:00 PM

Sem: V EC

Duration: 1 ½ Hrs

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least ONE from each Part.

Part – A

1.	Discuss the noise in DSBSC Receiver with a model receiver using coherent detection. Prove that the figure of merit for such receiver is unity.	10	CO1	BT1, BT2,
Or				
2.	Derive the expression for FOM of an AM Receiver.	10	CO1	BT1, BT2

Part – B

3.	Derive the expression for FOM for FM Receiver.	10	CO1	BT1, BT2
Or				
4.	Why pre-emphasis and de-emphasis are required? Explain how they are implemented.	10	CO1	BT2 BT2

Part-C

5.	Explain Shot Noise, White Noise and Thermal Noise.	10	CO1	BT1, BT2,
Or				
6.	Explain the following with respect to FM a) Threshold Effect b) Capture Effect.	10	CO1	BT1, BT2

Part-D

7.	The equation for a FM wave is $s(t) = 10 \sin [5.7 \times 10^8 t + 5 \sin 12 \times 10^3 t]$. Calculate: i) Carrier frequency ii) Modulating Frequency iii) Modulation index iv) Frequency Deviation v) Power dissipated in 100Ω	10	CO1	BT3, BT4
Or				
8.	Find the FOM of an AM receiver when depth of modulation is a) 100% b) 50% c) 30%.	10	CO1	BT3, BT4

Part-E

9.	Derive the time domain expression of frequency modulated wave. Define modulation index, maximum deviation of a frequency modulated signal.	10	CO1	BT1, BT2
Or				
10	Explain the generation of wideband frequency modulated wave by direct method.	10	CO1	BT1, BT2

Blooms Taxonomy Levels (BTL): BT1-Remembering BT2- Understanding BT3 – Applying BT4 – Analysing

C. S. Mahalingam

SUB CODE: 18EC53 SUB NAME: PCS

SEM&SEC: V & EC

Q.NO	Details of the Answer	Marks Distribution	Tot mar
1)	DSBSC - Receiver Modcs. $(SNR)_c = \frac{P_m A_c^2}{2 N_o W}$ $(SNR)_o = \frac{A_c^2 P_m}{2 N_o W}$ $FOM = \gamma = \frac{[SNR]_o}{[SNR]_c}$	2M. 2M. 4M. 2M	10M.
2)	AM Receiver $(SNR)_c = \frac{A_c^2 [1 + K_a^2 P_m]}{2 N_o W}$ $(SNR)_o = \frac{A_c^2 K_a^2 P_m}{2 N_o W}$ $FOM = \gamma = \frac{[SNR]_c}{[SNR]_o} = \frac{K_a^2 P_m}{1 + K_a^2 P_m}$	2M. 2M. 4M. 2M	10M.
3	FM Receiver $(SNR)_c = \frac{A_c^2}{2 N_o W}$ $(SNR)_o = \frac{3 A_c^2 K_f^2 P}{2 N_o W^3}$ $FOM = \frac{(SNR)_o}{(SNR)_c} = \frac{3}{2} \beta^2$	2M. 2M. 4M. 2M.	

Staff




Q.NO	Details of the Answer	Marks Distribution	Total marks
4.	Need for Pre-emphasis and De-emphasis Pre-emphasis implementation De-emphasis implementation	2M 4M 4M	10M
5.	Explain Shot Noise White Noise Thermal Noise	4M 3M 3M	10M
6.	Explanation with respect to FM Threshold effect capture effect	6M 4M	10M
7.	Carrier frequency = $\frac{2\pi fct}{2\pi}$ $= \frac{5.7 \times 10^8}{2\pi} = 90.718 \times 10^6 \text{ Hz}$ Modulating freq = $12 \times 10^3 = 2\pi fct$ $= \frac{12 \times 10^3}{2\pi} = 1.909 \times 10^3 \text{ Hz}$	2M 2M	

Staff J. Prasad

C. S. Mahalingam
HOD

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
	Modulation index $\beta = 5$	2M	
	Frequency Deviation $\Delta f_{\text{max}} = \beta \times f_m$ $= 5 \times 1.909 \times 10^{-3}$ $= 9.545 \times 10^{-3} \text{ Hz}$	2M	
	Power dissipated $P = \frac{A_c^2}{2R} = \frac{100}{200} = 0.5 \text{ W}$	2M	10M
8.	FOM = $\frac{u^2}{2+u^2}$ when $u = 100\%$ $FOM = \frac{u^2}{2+u^2} = \frac{1}{2+1} = 0.33$ $u = 50\% = 0.5$ $FOM = \frac{(0.5)^2}{2+(0.5)^2} = 0.111$ $u = 30\% = 0.3$ $FOM = \frac{0.3^2}{2+0.3^2} = 0.043$	1M 3M 3M	10M

Staff

J. Prasad

C.S. Mahalingam

HOD

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
9	Derivation Frequency Modulated Wave Bandwidth Modulation Index Maximum Deviation	8M 4M	10M
10	Derivation of wide band frequency Modulated wave direct Method Block Diagram	7M 3M	10M

Staff

J. Prasad

C. S. Mahalingam
HOD

CITY ENGINEERING COLLEGE

THIRD INTERNAL TEST

Program: Electronics and communication Engineering

Date: 12/1/2023

Course Name: PCS

Time: 10:30 – 12:00 PM

Sem: V EC

Duration: 1 ½ Hrs

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least ONE from each Part.

Part – A

1.	For a sinusoidal modulating signal, show that the signal to quantization noise ratio is $1.8 + 6R$ db, where R is the number of bits per sample	6	CO2	BT3, BT4
	Represent the binary data 10011101 in polar NRZ and bipolar RZ formatting.	4		
Or				
2.	Explain the working of TDM system with necessary block diagram.	10	CO3	BT1, BT2

Part – B

3.	Explain the generation and reconstruction of a PCM signal.	10	CO3, CO4	BT1, BT2
Or				
4.	What are the advantages of digital signal over analog signals	4	CO2	BT1, BT2
	State and prove sampling theorem for band limited signals.	6	CO2	BT1, BT2

Part-C

5.	What is Quantization noise? Derive the output signal to noise ratio of a uniform quantizer.	10	CO2	BT1, BT2
Or				
6.	With neat block diagram, explain the generation of pulse – position modulation (PPM) wave.	10	CO3	BT1, BT2

Part-D

7.	What is multiplexing. What are different types of multiplexing. Explain TDM with a neat block diagram.	10	CO3	BT1, BT2
Or				
8.	Define Pulse Amplitude Modulation. Obtain the expression for the Fourier Transform of PAM signal.	10	CO3	BT2, BT3

Part-E

9.	What is quantization process. Explain the different types of Quantization with their input output characteristics.	10	CO2	BT1, BT2
Or				
10	Draw the resulting waveform for 01101001 using unipolar NRZ, polar NRZ, unipolar RZ, bipolar RZ.	10	CO2	BT1, BT2

Blooms Taxonomy Levels (BTL): BT1-Remembering BT2- Understanding BT3 – Applying BT4 – Analysing

P. S. Mahalingam

SUB CODE: 18ECS3 SUB NAME: PCS

SEM&SEC: V

Q.NO	<u>Details of the Answer</u>	<u>Marks Distribution</u>	<u>Tot mar</u>
1.	<p>To P_{noise}</p> $[S/N] = 1.8 + 6R \text{ dB}$ <p>Representation 10011101 cm</p> <p>Polar NRZ</p> <p>RZ formatting</p>	<p>6M</p> <p>2M</p> <p>2M</p>	10M
2.	<p>Working of TDM</p> <p>Block Diagram</p> <p>Explanation</p>	<p>4M</p> <p>6M</p>	10M
3	<p>PCM Generator</p> <p>PCM Reconstructor</p>	<p>5M</p> <p>5M</p>	10M
4.	<p>Advantages of Digital Signals over Analog Signals</p> <p>Statement Sampling theorem</p> <p>Proof</p>	<p>4M</p> <p>2M</p> <p>4M</p>	10M

Staff

J. Prasad

C. S. Mahalingam

HOD

Q.NO	Details of the Answer	Marks Distribution	Total marks
5.	What is Quantization Noise. op SNR for Uniform Quantizer derivation	2M 8M	10M
6.	Block Diagram PPM. Explanation	4M 6M	10M
7.	What is Multiplexing Different types of Multiplexing Explanation TDM with Block diagram	2M 2M 6M	10M
8.	Definition PAM. Expression for the Fourier series Transform of PAM	2M 8M	10M

Staff

J. Prasad

C. S. Mahalingam

HOD

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
9.	Define Quantization process	2M	
	Different Types of Quantization		
	i) Mid Riser Type Quantizer	4M	
	ii) Mid Raiser Type Quantizer	4M	10M.
10	The wave form for		
	01101001 using		
	i) unipolar NRZ	3M	
	ii) Polar NRZ	3M	
	iii) Unipolar RZ	2M	
	iv) Bipolar RZ	2M	10M.

Staff *J. Prasad*

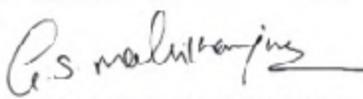
C. S. Mahalingam
HOD

RECORD OF CLASS WORK

Date	Period	Topics Covered
19-9-2022	4	I Overview of Internet of Things
21-9-2022	2	IOT conceptual Framework, IOT Architecture
22-9-2022	2	Technology Behind IOT, Sources of IOT,
23-9-2022	1	M2M comm ⁿ . Eg of IOT.
28-9-2022	2	Modified OSI Model for IOT,
29-9-2022	2	Data Enrichment, Consolidation and device mem ⁿ IOT
30-9-2022	1	Web commercialization protocols
6-10-2022	2	Message comm protocols (CoAP, CAP-MQ, MQTT, XMPP)
7-10-2022	1	II Internet Connectivity, Internet based comm ⁿ .
12-10-2022	2	IPv4, IPv6, 6LoWPAN protocols,
13-10-2022	2	IP Addressing in IOT.
14-10-2022	1	HTTP, HTTPS,
19-10-2022	2	FTP, Telnet and ports.
20-10-2022	2	Cloud computing paradigm * data collect ⁿ * storage
21-10-2022	1	Cloud service models.
31-10-2022	2	III Introduction, Prototyping Embedded dev ^t soft ware
2-11-2022	2	Programming Embedded Device Arduino using IDE
3-11-2022	2	Reading data from sensors and devices
4-11-2022	1	Gateways, Internet and Web / Cloud service software development
7-11-2022		↑
9-11-2022		↑
10-11-2022		PLACEMENT TRAINING.
11-11-2022		
16-11-2022		

.....

 Teacher's Signature

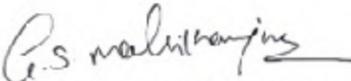
.....

 HOD'S Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
17-11-2022	↓	PLACEMENT TRAINING
18-11-2022		
23-11-2022		
24-11-2022		
28-11-2022		↓
1-12-2022	2	4 Challenges of Wireless Sensor Networks.
2-12-2022	1	Enabling Technologies for Wireless Sensor Networks
7-12-2022	2	Single Node Architecture - Hardware Components.
8-12-2022	2	Energy consumption of Sensor Nodes.
9-12-2022	4	Operating Systems and Execution Environment
15-12-2022	2	Network Arch - Sensor Network Scenarios
16-12-2022	4	Design Principles for WSN.
19-12-2022	4	Physical layer and Transceiver Design Considerations
21/12/2022	1	MAC protocols for WSN.
22-12-2022	3	Low Duty Cycle and Wake up concepts - SMAC
23-12-2022	4	Contention Based Protocols (CSMA, PAMA)
26-12-2022	1	Schedule Based Protocols (LEACH, S-MAC, TRAMA)
26-12-2022	2	Routing Protocols.



 Teacher's Signature



 HOD'S Signature



CITY
ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

CIRCULAR

Ref No: CEC/ISE/DAC/ACY2022-2023/02

Date: 20-03-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 24-03-2024 at 12: 00 AM in ISE department at Lab C001.

Agenda:

- Conduct an orientation for 4th semester students
- Planning of Internships for 6th semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures

HOD & Convener



CITY
ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Department Advisory Committee Meeting

Date: 24/03/2023

Time: 12:00 AM

Venue: Room No. C001

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Dr. N Rajasekher Reddy	HOD	Convenor
2	Mr. Vinod Kumar S.	Assistant Professor	Member
3	Mrs. Swethashree R N	Assistant Professor	Member
4	Mr. Vinod Kumar S.	Assistant Professor	Member
5	Mr. Mahesh Madhavan V	Founder of Fieldmobi.	(Industry Expert)
6	Ms. Madura H	SAP functional consultant, Exikon Technology Private Limited	Alumni

Handwritten signatures:
Row 1: [Signature]
Row 2: [Signature]
Row 3: [Signature]
Row 4: [Signature]
Row 5: [Signature]
Row 6: [Signature]

The Department Advisory Committee meeting is conducted at Department of ISE, on 24th March, 2023, at 12 AM.

Agenda of the Meeting:

- Conduct an orientation for 4th semester students
- Planning of Internships for 6th semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures.



CITY
ENGINEERING COLLEGE

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- Committee members suggested establishing MOUs with various IT industries to provide students with internship opportunities.
- It was proposed to conduct a technical symposium with increased student participation.
- The committee decided to organize guest lecture, industry visit, and workshop for students in the 4th, and 6th, semesters.
- It was discussed to conduct an orientation for third-year students to raise awareness about the 21-Scheme curriculum, particularly regarding registration for NSS, Yoga, or Physical Education.
- The HOD emphasized the importance of projects, Internship and the need to find opportunities for such initiatives.

HOD & Convener



CITY
ENGINEERING COLLEGE

Academic Year: 2022-23 / Even Sem

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

COURSE PREFERNCE

Name of the Faculty: Dr. N. Rajasekher Reddy

Designation: Professor

Year / Semester: II, IV

Sl. No	Course Code and Name	Year/Semester
1	21CS42: Design and Analysis of Algorithm	II/IV
2	21CS43:Microcontroller and Embedded Systems	II/IV
3	21CS44: Operating System	II/IV

Signature of faculty



ACADEMIC YEAR: 2022-23(Even)

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr. N. Rajasekher Reddy	18CS642-Object Oriented Modelling and Design	III/VI	
2	Dr. Sairabanu	21CS43-Microcontroller and Embedded System	II/IV	
		18CS63-Web technology and its Application	III/VI	
3	Mr. Vinod	18IS62-software Testing	III/VI	
		18CS482-Unix Cell Programming	II/IV	
		18IS166-Software Testing lab	III/VI	
4	Swetharani R/ N	18IS61-FILE STRUCTURES	III/VI	
		21CS42-DAA Lab	II/IV	
		18IS166-SOFTWARE TESTING LABORATORY	III/VI	



HOD, ISE



CITY ENGINEERING COLLEGE

Department of Information Science Engineering

Academy Year 2022-2023

Time Table

III Year/ VI Semester

Room: C-204

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	OE	ST(R.No:C104)	SHORT BREAK	FS(R.No:C104)	WEB		MAD LAB		
TUE	WEB	OOMD		ST	CG		ST(T)+ST LAB		
WED	WEB	OE		MAD(T)	MAD(T)				
THU	FS(T)	OE		WEB	OOMD		FS(T)+FS LAB		
FRI	OOMD	CG		WEB(T)	ST		ST		
SAT	ST(T)	ST(T)		FS(T)	FS(T)				

Sl. No	Course Code	Course Name	Course	Faculty Name
1	18IS61	FILE STRUCTURES	FS	Mrs. Swethashree R N
2	18IS62	SOFTWARE TESTING	ST	Mr. Vinod Kumar S.
3	18CS63	WEB TECHNOLOGIES AND ITS APPLICATIONS	WEB	Dr. Sairabanu
4	18CS642	OBJECT ORIENTED MODELLING AND DESIGN	OOMD	Dr. N Rajasekhar Reddy
5	18ME651	NON-CONVENTIONAL ENERGY SOURCES	OE	Dr.E.Mohan
6	18ISI66	SOFTWARE TESTING LABORATORY	ST LAB	Mr. Vinod Kumar S./ Mrs. Swethashree R N
7	18ISL67	FILE STRUCTURES LAB WITH MINI PROJECT	FS LAB	Mrs. Vani
8	18CSMP68	MOBILE APP DEVELOPMENT	MAD LAB	Mr. Doreswamy G S

Vani

Class Teacher: Mrs. Vani

N Rajasekhar Reddy

HOD: N Rajasekher Reddy

H N Thippeswamy

Principal: Principal: Dr. H N Thippeswamy



CITY ENGINEERING COLLEGE

Department of Information Science Engineering

Academy Year 2022-2023

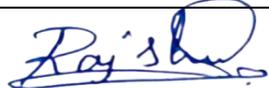
Time Table

II Year/ IV Semester

Room: C-304

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM	
MON	PYTHON LAB		SHORT BREAK	CIP	MATHS		DEPT/COLLEGE ACTIVITIES /LIBRARY			
TUE	MATHS	DAA		OS	UHV		DAA LAB BATCH 1			
WED	DAA LAB BATCH 2			DAA	MES		OS	MATHS		
THU	OS	MATHS		BIO	UNIX		MES			
FRI	BIO	OS		MES	DAA		MES LAB			
SAT	MATDIP			INTERNSHIP PRESENTATION						
Sl . No	Course Code	Course Name			Course	Faculty Name				
1	21CS41	Mathematical Foundation for Computing			Maths	Ms.Vanitha				
2	21CS42	Design and Analysis of Algorithm			DAA	Dr. N Rajasekhar Reddy				
3	21CS43	Microcontroller and Embedded Systems			MES	Dr. Sairabanu				
4	21CS44	Operating System			OS	Mr. Nandish A C				
5	21BE45	Biology for Engineers			BIO	Ms.Meghana				
6	21CSL46	Python Programming Laboratory			PYTHON	Dr.VivekYoganand A				
7	21CIP47	Constitution of India and Professional Ethics			CIP	Ms.Meghana				
8	21CS482	Ability Enhancement Course (Unix Shell Programming)			UNIX	Mr. Vinod Kumar S.				
9	21UH49	Universal Human Values			UHV	Dr.E.Mohan				
10	21MATDIP41	Additional Maths -1			MATDIP	Mrs.Rekha / Mrs. Vanitha				
11	21CS42	DAA Lab				Mrs. Swethashree R N				
12		MES Lab				Mrs. Madhavi Kulkarni/ Mrs. Vani				


Class Teacher: Prof. Nandish. A. C


HOD: N Rajasekher Reddy


Principal: Principal: Dr. H N Thippeswamy



CITY ENGINEERING COLLEGE
Department of Information Science Engineering

Academy Year 2022-2023(Even)

Time Table

Faculty Name: Dr. N Rajasekhar Reddy

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM	
MON		DAA	SHORT BREAK			LUNCH BREAK				
TUE		OOMD								
WED				DAA						
THU								OOMD		
FRI	OOMD				DAA					
SAT										

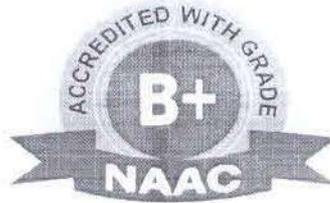
N Rajasekher Reddy

HOD,ISE



CITY
ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING



COURSE FILE

NAME	AMBIKA P.R
DESIGNATION	Associate Professor
SEMESTER	IV
SECTION	'D'
SUBJECT NAME/CODE	Operating systems - 21CS44
ACADEMIC YEAR	2022-23



CITY

ENGINEERING COLLEGE

VISION

Making Remarkable Contribution by Disseminating Knowledge on Emerging Trends in Engineering and Technology through various Programmes, Innovation and Research so as to Excel in Quality both at National and International level and to provide Career Guidance & Training for Employment.

MISSION

- M1- To encourage Knowledge Acquisition and Foster Innovation & Research.
- M2- To Prepare Students for Immediate Employment, leading to Technological and Socio- economical growth.
- M3- To Provide Guidance for a Productive Career under various programmes.



CITY
ENGINEERING COLLEGE

PROGRAM OUTCOMES (PO)

PO1 – Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 – Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 – Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 – Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 – Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 – The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 – Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 – Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 – Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 – Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 – Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 – Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcome

Computer Science & Engineering: Graduates are able to Analyze, Design and Construct Civil Engineering systems with state-of-the art Technologies.



CITY
ENGINEERING COLLEGE

DEPARTMENT VISION AND MISSION

VISION:

To contribute to Global Development by producing Knowledgeable and Quality professionals who are Innovative and Successful in advanced field of Computer Science & Engineering to adapt the changing Employment demands and social needs.

MISSION:

- M1: To provide Quality Education for students, to build Confidence by developing their Technical Skills to make them Competitive Computer Science Engineers.
- M2: To facilitate Innovation & Research for students and faculty and to provide Internship opportunities.
- M3: To Collaborate with educational institutions and industries for Excellence in Teaching and Research.

PROGRAM EDUCATION OBJECTIVES (PEO):

- PEO1: Graduates will have strong foundation in Basic Engineering Sciences that are required for problem solving to succeed in their profession.
- PEO2: Graduates will have scientific and engineering knowledge in cutting edge technologies so as to design and solve real life problems using the acquired skills and lifelong learning.
- PEO3: Graduates will be professionals with ethics, good communication skills, teamwork capability, and relate engineering problems with social context.

PROGRAM SPECIFIC OUTCOME (PSO):

Graduates will be Proficient with Analytical and Logical skills and will be able to Design, Develop, Test and Maintain software and computer systems in phase with the advancing technology.



CITY
ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING /ISE

CONTENTS

1.	COLLEGE CALENDER OF EVENTS
2.	DEPARTMENT CALENDER OF EVENTS
3.	CLASS TIME TABLE AND INDIVISUAL TIME TABLE
4.	UNIVERSITY SYLLABUS
5.	LESSON PLAN
6.	STUDENT-LIST
7.	RECORD OF CLASS WORK (SECTION WISE)
8.	UNIVERSITY QUESTION PAPERS
9.	MODULE WISE QUESTION BANK
	ASSIGNMENT QUESTIONS
11.	NEW TEACHING LEARNING INITIATIVES
12.	REMIDIAL/TUTORIAL CLASSES CONDUCTED, IF APPLICABLE
13.	CONTINUOUS INTERNAL EVALUATION(CIE):
13.1	ATTENDANCE SHORTAGE LIST
13.2	CIE QUESTION PAPER AND SCHEME
13.3	TOPPERS LIST AND BELOW AVERAGE STUDENT LIST
13.4	COUNSELING FORM
14.	RESULT ANALYSIS AND FEEDBACK
14.1	FINAL CIE MARKS LIST (UNIVERSITY COPY)
14.2	SUBJECT RESULT AND STUDENT FEEDBACK



CITY ENGINEER COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 Even SEM

DAY	May 2023		June 2023		July 2023		Aug 2023		Sept 2023	
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON	1									
TUE	2						1			
WED	3						2			
THU	4						3			
FRI	5						4			
SAT	6	1st Saturday holiday	3	1st Saturday holiday	1	1st Saturday holiday	5	1st Saturday holiday	1	Start of II sem Practical
SUN	7		4		2		6		2	1st Saturday holiday
MON	8		5	4th sem start 8th sem Practical	3		7		3	
TUE	9		6		4		8		4	
WED	10		7		5		9		5	
THU	11		8		6		10		6	
FRI	12		9		7		11		7	
SAT	13		10		8		12		8	
SUN	14		11		9		13		9	II sem last working day
MON	15		12		10	VI SEM LAST WORKING day	14		10	
TUE	16	8th sem theory exam	13		11	6 th sem practical exam	15	Independence day	11	Start of II sem Practical exam
WED	17		14		12		16		12	
THU	18	8th sem theory exam	15		13		17		13	
FRI	19		16		14		18		14	
SAT	20	3rd Saturday holiday	17	3rd Saturday holiday	15	3rd Saturday holiday	19	3rd Saturday holiday	15	IV sem last working day
SUN	21		18		16		20		16	3rd Saturday holiday
MON	22		19		17		21		17	
TUE	23		20		18		22		18	Ganesha festival
WED	24		21		19		23		19	Start of IV sem Practical
THU	25	II SEM START IV sem Internship	22		20		24		20	
FRI	26		23		21		25		21	Start of II sem Theory exam
SAT	27		24		22		26		22	
SUN	28		25		23		27		23	
MON	29		26		24	6TH sem Theory exam	28		24	
TUE	30		27		25		29		25	
WED	31		28		26		30		26	
THU			29	Bakrid	27		31		27	
FRI			30		28				28	Id Milad
SAT					29	Moharam			29	
SUN					30				30	
MON					31				31	
									3/10	Start of IV sem Theory

[Handwritten signature]

CITY ENGINEER COLLEGE, BENGALURU-560061

IV Semester

OPERATING SYSTEMS			
Course Code:	21CS44	CIE Marks	50
Teaching Hours/Week (L:T:P:S)	2:020:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Course Objectives:			
<p>CLO 1. Demonstrate the need for OS and different types of OS</p> <p>CLO 2. Apply suitable techniques for management of different resources</p> <p>CLO 3. Use processor, memory, storage and file system commands</p> <p>CLO 4. Realize the different concepts of OS in platform of usage through case studies</p>			
Teaching-Learning Process (General Instructions)			
<p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> Lecturer methods (L) need not to be only traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes. Use of Video/Animation to explain functioning of various concepts. Encourage collaborative (Group Learning) Learning in the class. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it. Introduce Topics in manifold representations. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding. 			
Module-1			
<p>Introduction to operating systems, System structures: What operating systems do; Computer System organization; Computer System architecture; Operating System structure; Operating System operations; Process management; Memory management; Storage management; Protection and Security; Distributed system; Special-purpose systems; Computing environments.</p> <p>Operating System Services: User - Operating System interface; System calls; Types of system calls; System programs; Operating system design and implementation; Operating System structure; Virtual machines; Operating System generation; System boot.</p> <p>Process Management: Process concept; Process scheduling; Operations on processes; Inter process communication</p>			
Textbook 1: Chapter - 1,2,3			
Teaching-Learning Process	<p>Active learning and problem solving</p> <ol style="list-style-type: none"> https://www.youtube.com/watch?v=vBURt97EkA&list=PLBlNk6fEyqRiVhbXDGLXdkOQAeuVcp20 https://www.youtube.com/watch?v=a2B69vCtjOU&list=PL3-wYxht4yCjpcfUDz-TgDainZ2K3MUZ&index=2 		
Module-2			

Multi-threaded Programming: Overview; Multithreading models; Thread Libraries; Threading issues. Process Scheduling: Basic concepts; Scheduling Criteria; Scheduling Algorithms; Multiple-processor scheduling; Thread scheduling.

Process Synchronization: Synchronization: The critical section problem; Peterson's solution; Synchronization hardware; Semaphores; Classical problems of synchronization; Monitors.

Textbook 1: Chapter - 4,5

Teaching-Learning Process

Active Learning and problem solving

1. <https://www.youtube.com/watch?v=HW2Wcx-ktsc>
2. <https://www.youtube.com/watch?v=9YRxhlvt9Zo>

Module-3

Deadlocks: Deadlocks; System model; Deadlock characterization; Methods for handling deadlocks; Deadlock prevention; Deadlock avoidance; Deadlock detection and recovery from deadlock.

Memory Management: Memory management strategies: Background; Swapping; Contiguous memory allocation; Paging; Structure of page table; Segmentation.

Textbook 1: Chapter - 7,8

Teaching-Learning Process

Active Learning, Problem solving based on deadlock with animation

1. <https://www.youtube.com/watch?v=MYgmmJJfdBg>
2. https://www.youtube.com/watch?v=Y14b7_T3AEw&list=PLEJxKK7AcSEGPOCFtQTJhOEIU44JJAun&index=30

Module-4

Virtual Memory Management: Background; Demand paging; Copy-on-write; Page replacement; Allocation of frames; Thrashing.

File System, Implementation of File System: File system: File concept; Access methods; Directory structure; File system mounting; File sharing; Protection: Implementing File system: File system structure; File system implementation; Directory implementation; Allocation methods; Free space management.

Textbook 1: Chapter - 9,10,11

Teaching-Learning Process

Active learning about memory management and File system

1. <https://www.youtube.com/watch?v=pJ6qrCB8pDw&list=PLIY8eNdw5tW-BxRY0yK3fYTYVqytw8qhp>
2. <https://www.youtube.com/watch?v=-orfFhvNBzY>

Module-5

Secondary Storage Structures, Protection: Mass storage structures; Disk structure; Disk attachment; Disk scheduling; Disk management; Swap space management. Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix, Implementation of access matrix, Access control, Revocation of access rights, Capability- Based systems.

Case Study: The Linux Operating System: Linux history; Design principles; Kernel modules; Process management; Scheduling; Memory Management; File systems, Input and output; Inter-process communication.

Textbook 1: Chapter - 2,21

Teaching-Learning Process

Active learning about case studies

1. <https://www.youtube.com/watch?v=TTBkc5eiju4>
2. https://www.youtube.com/watch?v=8hkvMRGTzCM&list=PLEAYkSg4uSQ2PAch478muxnoeTNz_QeUI&index=36
3. <https://www.youtube.com/watch?v=mX1FEur4VCw>

Course Outcomes (Course Skill Set)

At the end of the course the student will be able to:

- CO 1. Identify the structure of an operating system and its scheduling mechanism.
- CO 2. Demonstrate the allocation of resources for a process using scheduling algorithm.
- CO 3. Identify root causes of deadlock and provide the solution for deadlock elimination
- CO 4. Explore about the storage structures and learn about the Linux Operating system.
- CO 5. Analyze Storage Structures and Implement Customized Case study

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks (duration 01 hour)**

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of **10 Marks**

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods /question paper has to be designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

1. The question paper will have ten questions. Each question is set for 20 marks. Marks scored shall be proportionally reduced to 50 marks
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module

Suggested Learning Resources:

Textbooks

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Principles 7th edition, Wiley-India, 2006

Reference Books

1. Ann McHoes Ida M Fylnn, Understanding Operating System, Cengage Learning, 6th Edition
2. D.M Dhamdhere, Operating Systems: A Concept Based Approach 3rd Ed, McGraw- Hill, 2013.
3. P.C.P. Bhatt, An Introduction to Operating Systems: Concepts and Practice 4th Edition, PHI(EEE), 2014.
4. William Stallings Operating Systems: Internals and Design Principles, 6th Edition, Pearson.

Weblinks and Video Lectures (e-Resources):

1. https://www.youtube.com/watch?v=vBURTt97EkA&list=PLBlnK6fEygRiVhbXDGLXDk_OQAe_uVcp20
2. https://www.youtube.com/watch?v=783KAB-tuE4&list=PLIemF3uozcAKTgsClj82voMK3TMR0YE_f
3. <https://www.youtube.com/watch?v=3-ITLMMeeXY&list=PL3pGy4Htqwd0n7bQfhjPnsWzkeR-n6mk0>

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Real world problem solving using group discussion.
- Role play for process scheduling.
- Present animation for Deadlock.
- Real world examples of memory management concepts



DEPARTMENT OF ISE

LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2022 - 2023

Course Title: Operating Systems	Course Code: 21CS44
Total contact hours: L: T:P:S: 2: 2: 0: 0	End Term Marks :50
Internal Marks: 50	
Semester: IV – 'D'	Academic year: 2022-23
Lesson plan Author: Mrs. Ambika P R	Date :05/06/2023

Course objectives:

- CLO 1. Demonstrate the need for OS and different types of OS
 CLO 2. Apply suitable techniques for management of different resources
 CLO 3. Use processor, memory, storage and file system commands
 CLO 4. Realize the different concepts of OS in platform of usage through case studies

Course Outcomes (Course Skill Set):

At the end of the course the student will be able to:

- CO 1. Identify the structure of an operating system and its scheduling mechanism.
 CO 2. Demonstrate the allocation of resources for a process using scheduling algorithm.
 CO 3. Identify root causes of deadlock and provide the solution for deadlock elimination
 CO 4. Explore about the storage structures and learn about the Linux Operating system.
 CO 5. Analyze Storage Structures and Implement Customized Case study.

Module 1

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	Introduction to operating systems, System structures: What operating systems do	L1, L2	CO1
	Computer System organization, Computer System architecture	L1, L2	CO1
	Operating System Structure	L1, L2	CO1
	Operating System operations; Process management;	L1, L2	CO1
2	Memory management; Storage management	L1, L2	CO1
	Protection and Security; Distributed system	L1, L2	CO1
	Special-purpose systems; Computing environments.	L1, L2	CO1
	Operating System Services; User - Operating System interface; System calls; Types of system calls	L1, L2	CO1
3	System programs; Operating system design and implementation Operating System structure	L1, L2	CO1
	Virtual machines; Operating System generation; System boot	L1, L2	CO1
	Process Management Process concept; Process scheduling;	L1, L2	CO1
	Operations on processes; Inter process communication	L1, L2	CO1

Module 2

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
4	Multi-threaded Programming: Overview; Multithreading models	L1, L2	CO2
	Thread Libraries	L1, L2	CO2
	Threading issues	L1, L2	CO2
	Process Scheduling: Basic concepts; Scheduling Criteria	L1, L2	CO2
5	Revision		
	FIRST CIE		
6	Scheduling Algorithms	L2, L3	CO2
	Scheduling Algorithms	L2, L3	CO2
	Scheduling Algorithms	L2, L3	CO2
	Multiple-processor scheduling; Thread scheduling.	L2, L3	CO2
7	Process Synchronization: Synchronization: The critical section problem; Peterson's solution	L1, L2	CO2
	Synchronization hardware; Semaphores	L1, L2	CO2
	Classical problems of synchronization	L1, L2	CO2
	Monitors	L1, L2	CO2

Module 3

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
8	Deadlocks: Deadlocks; System model; Deadlock characterization	L1, L2	CO3
	Methods for handling deadlocks; Deadlock prevention	L2, L3	CO3
	Deadlock avoidance	L2, L3	CO3
	Banker's algorithm example	L2, L3	CO3
9	Deadlock detection	L2, L3	CO3
	Recovery from deadlock	L2, L3	CO3
	Memory Management: Memory management strategies: Background	L1, L2	CO4
	Swapping	L1, L2	CO4
10	Contiguous memory allocation	L1, L2, L3	CO4
	SECOND CIE		
11	Paging	L1, L2	CO4
	Structure of page table; Segmentation.	L1, L2, L3	CO4

Module 4

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
11	Virtual Memory Management: Background; Demand paging	L1, L2	CO4
	Copy-on-write; Page replacement	L1, L2, L3	CO4
12	Page replacement algorithms	L1, L2	CO4
	Allocation of frames; Thrashing	L1, L2, L3	CO4

	File System, Implementation of File System: File concept	L1, L2	CO4
	Access methods; Directory structure	L1, L2, L3	CO4
13	File system mounting; File sharing; Protection	L1, L2	CO4
	Implementing File system: File system structure; File system implementation; Directory implementation	L1, L2	CO4
	Allocation methods; Free space management.	L1, L2, L3	CO4

Module 5

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
13	Secondary Storage Structures, Protection: Mass storage structures; Disk structure; Disk attachment	L1, L2	CO5
14	Disk scheduling; Disk management; Swap space management	L1, L2, L3	CO5
	Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix	L1, L2	CO5
	Implementation of access matrix, Access control, Revocation of access rights, Capability- Based systems.	L1, L2, L3	CO5
	Case Study: The Linux Operating System: Linux history; Design principles; Kernel modules	L1, L2	CO5
15	Process management; Scheduling; Memory Management	L1, L2	CO5
	File systems, Input and output; Inter-process communication.	L1, L2	CO5
	THIRD CIE		

RBT Level

L1-Remembering L2-Understanding L3-Applying L4-Analysing L5-Evaluating L6-Creating

Text Books:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Principles 7th edition, Wiley-India, 2006.

Reference Books:

1. Ann McHoes Ida M Fylnn, Understanding Operating System, Cengage Learning, 6th Edition
2. D.M Dhamdhare, Operating Systems: A Concept Based Approach 3rd Ed, McGraw- Hill, 2013.
3. P.C.P. Bhatt, An Introduction to Operating Systems: Concepts and Practice 4th Edition, PHI(EEE), 2014.
4. William Stallings Operating Systems: Internals and Design Principles, 6th Edition, Pearson.

Weblinks and Video Lectures (e-Resources):

1. https://www.youtube.com/watch?v=vBURTt97EkA&list=PLBlnK6fEyqRiVhbXDGLXDk_OQAe uVcp2O
2. https://www.youtube.com/watch?v=783KABtuE4&list=PLIemF3uozcAKTgsClj82voMK3TMR0YE_f
3. <https://www.youtube.com/watch?v=3ITLMMeeXY&list=PL3pGy4HttqwD0n7bQfHjPnsWzkeR-n6mkO>


Signature of Faculty

Signature of HOD

City Engineering College
Department of CSE/ ISE/ AI ML

QUESTION BANK

SUBJECT: OPERATING SYSTEM
SEMESTER: IV

SECTIONS: A, B, C, D
SUB CODE: 21CS44

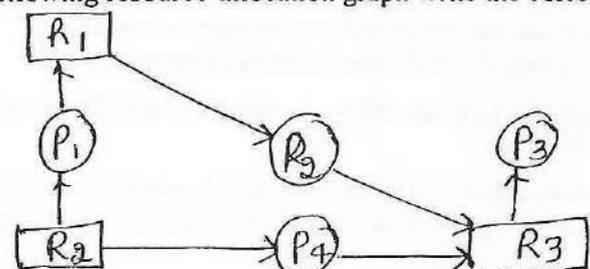
MODULE 1

Q.no	Questions
1.	Define an operating system.Explain two view points of OS role.Also explain abstract view of the components of a computer system?
2.a.	What are OS operation?Explain.
b.	Give a note on Distributed Systems?
3.	Discuss the operating system functions or services.
4.	What are the major activities of OS with regards to process and memory managment?
5.	What are system calls?Explain different types of system calls?
6.	Expalin the types of multiprocessor systems and the types of clustering.
7.	Explain different categories of system programs.
8.	Differentiate between multiprogramming and multi tasking systems.
9.	Explain the advantages of layered approach with a neat diagram.
10.	What are virtual machines?Explain its advantages with a neat diagram.
11.	Explain the just-in-time(JIT) compiler,used in java virtual machine.
12.	With a diagram of VM-WARE architecture,Explain the concept of virtual machine(VM) and main advantages of using VM architecture.
13.	What is process?With a state diagram,explain states of a process.
14.a.	Write a not on context switch.
b.	What is PCB?Enumerate and explain various fields in PCB.
15.	Explain direct and indirect communication with respect to message passing systems.
16.	Explain the difference between long term and short term and medium term schedulers .
17.	Describe implementation of IPC using shared memory and message passing.

MODULE 2

Q.no	Questions																								
1.	What are the differences between user level and kernel level threads?																								
2.	Discuss common ways of establishing relationship between user and kernel thread.																								
3.	Differentiate between 1.process and thread 2.short term and medium term sheduler 3.user level and kernel level threads 4.waiting and turnaround time																								
4.	Define the five scheduling criteria considered in Process scheduling																								
5.	Discuss any 4 treading isuses that come with multithreaded programs.																								
6.	<p>Consider the following set of processes.Assume the length of the CPU burst time is given in milliseconds</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th>Process</th> <th>Arrival time</th> <th>Burst time</th> <th>priority</th> </tr> </thead> <tbody> <tr> <td>p1</td> <td>0</td> <td>10</td> <td>3</td> </tr> <tr> <td>p2</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>p3</td> <td>3</td> <td>2</td> <td>3</td> </tr> <tr> <td>p4</td> <td>5</td> <td>1</td> <td>4</td> </tr> <tr> <td>p5</td> <td>10</td> <td>5</td> <td>2</td> </tr> </tbody> </table> <p>Draw gantt charts illustrating the execution of these processes using FCFS and pre-emptive priority scheduling algorithm.assume highest priority=1 and lowest priority=4.also calculate average waiting time and average turn around time of both the algorithms.</p>	Process	Arrival time	Burst time	priority	p1	0	10	3	p2	0	1	1	p3	3	2	3	p4	5	1	4	p5	10	5	2
Process	Arrival time	Burst time	priority																						
p1	0	10	3																						
p2	0	1	1																						
p3	3	2	3																						
p4	5	1	4																						
p5	10	5	2																						
7.	<p>Following is the snapshot of a cpu</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th>process</th> <th>CPU burst</th> <th>Arrival time</th> </tr> </thead> <tbody> <tr> <td>p1</td> <td>10</td> <td>0</td> </tr> <tr> <td>p2</td> <td>29</td> <td>1</td> </tr> <tr> <td>p3</td> <td>03</td> <td>2</td> </tr> <tr> <td>p4</td> <td>07</td> <td>3</td> </tr> </tbody> </table> <p>Draw gantt chart and calculate the waiting and turnaround time using FCFS,SJF nad RR with time quatum 10 scheduling algorithms</p>	process	CPU burst	Arrival time	p1	10	0	p2	29	1	p3	03	2	p4	07	3									
process	CPU burst	Arrival time																							
p1	10	0																							
p2	29	1																							
p3	03	2																							
p4	07	3																							
8.	<p>Consider the following set of processes with CPU burst time(in m sec)</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th>process</th> <th>arrival</th> <th>Burst time</th> </tr> </thead> <tbody> <tr> <td>p0</td> <td>0</td> <td>6</td> </tr> <tr> <td>p1</td> <td>1</td> <td>3</td> </tr> <tr> <td>p2</td> <td>2</td> <td>1</td> </tr> <tr> <td>p3</td> <td>3</td> <td>4</td> </tr> </tbody> </table> <p>i)Draw gantt chart illustrating the executing of above proccsscs using SRTF and non preemptive SJF ii)Find the turn around time for each processes for SRTF and SJF.hence show that SRTF is faster than SJF</p>	process	arrival	Burst time	p0	0	6	p1	1	3	p2	2	1	p3	3	4									
process	arrival	Burst time																							
p0	0	6																							
p1	1	3																							
p2	2	1																							
p3	3	4																							

MODULE 3

Q.no	Questions																																																																														
1.	What are deadlocks? Explain the necessary conditions for its occurrence.																																																																														
2.a.	Dead lock exists if a cycle exists. Yes or no. Justify your answer with a suitable example.																																																																														
b.	What is Resource Allocation Graph(RAG)? Explain how RAG is very useful in describing deadly embrace (dead lock)by considering your own example																																																																														
3.	<p>For the following resource-allocation graph write the corresponding wait-for graph.</p> 																																																																														
4.	Explain the process of recovery from deadlock.																																																																														
5.	Using Banker's algorithm determine whether the system is in a safe state.																																																																														
6.	<p>Consider the following snapshot of a system:</p> <table border="1"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>P₀</td> <td>0</td> <td>0</td> <td>1</td> <td>2</td> <td>0</td> <td>0</td> <td>1</td> <td>2</td> <td>1</td> <td>5</td> <td>2</td> <td>0</td> </tr> <tr> <td>P₁</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>7</td> <td>5</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₂</td> <td>1</td> <td>3</td> <td>5</td> <td>4</td> <td>2</td> <td>3</td> <td>5</td> <td>6</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₃</td> <td>0</td> <td>6</td> <td>3</td> <td>2</td> <td>0</td> <td>6</td> <td>5</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₄</td> <td>0</td> <td>0</td> <td>1</td> <td>4</td> <td>0</td> <td>6</td> <td>5</td> <td>6</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Answer the following questions using the Banker's algorithm: i) What is the content of matrix need? ii) Is the system in a safe state? iii) If a request from process P1 arrives for(0,4,2,0) can the request be granted immediately?(10) iv) Is the system in a safe state?</p>		A	B	C	D	A	B	C	D	A	B	C	D	P ₀	0	0	1	2	0	0	1	2	1	5	2	0	P ₁	1	0	0	0	1	7	5	0					P ₂	1	3	5	4	2	3	5	6					P ₃	0	6	3	2	0	6	5	2					P ₄	0	0	1	4	0	6	5	6				
	A	B	C	D	A	B	C	D	A	B	C	D																																																																			
P ₀	0	0	1	2	0	0	1	2	1	5	2	0																																																																			
P ₁	1	0	0	0	1	7	5	0																																																																							
P ₂	1	3	5	4	2	3	5	6																																																																							
P ₃	0	6	3	2	0	6	5	2																																																																							
P ₄	0	0	1	4	0	6	5	6																																																																							
7.	<p>System consists of five jobs (J1,J2,J3,J4,J5) and three resources (R1,R2,R3) . Resource type R1 has 10 instances, resource type R2 has 5 instances and R3 has 7 instances. The following snapshot of the system has been taken:</p> <table border="1"> <thead> <tr> <th></th> <th>R₁</th> <th>R₂</th> <th>R₃</th> <th>R₁</th> <th>R₂</th> <th>R₃</th> <th>R₁</th> <th>R₂</th> <th>R₃</th> </tr> </thead> <tbody> <tr> <td>J₁</td> <td>0</td> <td>1</td> <td>0</td> <td>7</td> <td>5</td> <td>3</td> <td>3</td> <td>3</td> <td>2</td> </tr> <tr> <td>J₂</td> <td>2</td> <td>0</td> <td>0</td> <td>3</td> <td>2</td> <td>2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>J₃</td> <td>3</td> <td>0</td> <td>2</td> <td>9</td> <td>0</td> <td>2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>J₄</td> <td>2</td> <td>1</td> <td>1</td> <td>2</td> <td>2</td> <td>2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>J₅</td> <td>0</td> <td>0</td> <td>2</td> <td>4</td> <td>3</td> <td>3</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Find need matrix and calculate the safe sequence by using Banker's algorithm. Mention the above system is safe or not safe.</p>		R ₁	R ₂	R ₃	R ₁	R ₂	R ₃	R ₁	R ₂	R ₃	J ₁	0	1	0	7	5	3	3	3	2	J ₂	2	0	0	3	2	2				J ₃	3	0	2	9	0	2				J ₄	2	1	1	2	2	2				J ₅	0	0	2	4	3	3																					
	R ₁	R ₂	R ₃	R ₁	R ₂	R ₃	R ₁	R ₂	R ₃																																																																						
J ₁	0	1	0	7	5	3	3	3	2																																																																						
J ₂	2	0	0	3	2	2																																																																									
J ₃	3	0	2	9	0	2																																																																									
J ₄	2	1	1	2	2	2																																																																									
J ₅	0	0	2	4	3	3																																																																									
8.	<p>Using Banker's algorithm determine whether the system is in a safe state.</p> <table border="1"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>P₀</td> <td>0</td> <td>0</td> <td>2</td> <td></td> <td>0</td> <td>0</td> <td>4</td> <td></td> <td>1</td> <td>0</td> <td>2</td> </tr> <tr> <td>P₁</td> <td>1</td> <td>0</td> <td>0</td> <td></td> <td>2</td> <td>0</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₂</td> <td>1</td> <td>3</td> <td>5</td> <td></td> <td>1</td> <td>3</td> <td>7</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₃</td> <td>6</td> <td>3</td> <td>2</td> <td></td> <td>8</td> <td>4</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P₄</td> <td>1</td> <td>4</td> <td>3</td> <td></td> <td>9</td> <td>5</td> <td>7</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>If a request from process P2 arrives for (0 0 2), can the request be granted immediately?</p>		A	B	C	D	A	B	C	D	A	B	C	P ₀	0	0	2		0	0	4		1	0	2	P ₁	1	0	0		2	0	1					P ₂	1	3	5		1	3	7					P ₃	6	3	2		8	4	2					P ₄	1	4	3		9	5	7										
	A	B	C	D	A	B	C	D	A	B	C																																																																				
P ₀	0	0	2		0	0	4		1	0	2																																																																				
P ₁	1	0	0		2	0	1																																																																								
P ₂	1	3	5		1	3	7																																																																								
P ₃	6	3	2		8	4	2																																																																								
P ₄	1	4	3		9	5	7																																																																								
9.	Consider the following snapshot of a system.																																																																														

9. Consider the following set of processes with arrival time

process	Burst time	Arrival time
p1	10	0
p2	1	0
p3	2	1
p4	4	2
p5	3	2

i) Draw gantt charts using FCFS, SJF preemptive and non preemptive scheduling.

ii) Calculate the average waiting time for each of the scheduling algorithm.

10. Explain the critical section problem. List and explain the requirement to be met by a solution to critical section problem.
11. Describe an n-process solution to critical section problem which uses test and set () hardware instruction. Prove how its algorithm satisfies all the requirements of critical section problems solution.
12. Explain Peterson's solution to critical section problem
13. What are semaphores? Explain any three use cases of semaphores
14. What do you mean by a binary semaphore and a counting semaphore?
15. What is race condition? Explain Reader's writer's problem with semaphores
16. What is semaphore? Explain how it can be used to solve the producer-consumer problem
17. What are monitors? Explain its usage and implementation.
18. Explain the range of monitors with a schematic view of its structure; write a monitor solution to bounded- buffer problem.
19. Describe the monitor solution to the classical dining philosopher's problem.
20. What is busy waiting in a critical section concept? How semaphore is used to solve critical section problem? What are the advantages of semaphore?

MODULE 4

Q.no	Questions
1.	What is thrashing? How does the system detect thrashing?
2.a.	Discuss on the performance of demand paging.
b.	
3.	. Short notes on: a. Page replacement algorithms b. Steps in handling page fault.
4.	What do you mean by a copy-on-write? Where is it used? Explain in brief.
5.	Consider the following page reference string 1,2,3,5,2,3,5,7,2,1,2,3,8,6,4,3,2,2,3,6. Assuming there are three memory frames, how many faults would occur in the case of i) LRU ii) Optimal algorithm. Note that initially all frames are empty.
6.	Consider the following sequence of memory references from a 460 word program. 10,11,104,170,73,309,185,245,246,434,458,364 i) Show the reference string assuming page size of 100 words ii) Find page fault rate for the above reference string assuming 200 words of primary memory available and FIFO and LRU replacement algorithms.
7.	Explain briefly the various operations performed on files.
8.	Explain the various access method of files.
9.	. Explain various allocation methods in implementing file systems.
10.	Explain different approaches to managing free space on disk storage.
11.	Describe the various directory structures
12.a.	With supporting diagrams distinguish between single-level and two-level directory structure.
b.	Compare contiguous and linked allocation methods for disk space.
c.	Explain bit vector free-space management technique
13.	Explain various file protection mechanisms.

	<p>Answer the questions using Banker's algorithm. i) What is the content of the matrix need? ii) Is the system is safe state? iii) If a request P1 arrives for (1,0,2), can the request be granted immediately?</p>
10.	For the following snapshot find the safe sequence using Banker's algorithm: The number of resource units are R1,R2,R3 which are 7,7,10 respectively.
11.	Distinguish between internal and external fragmentation.
12.	Explain with a diagram, how TLB is used to solve the problem of simple paging scheme.
13.	Discuss paging with an example.
15.a.	What is Belady's anomaly? Explain with an example.
b.	Distinguish between: i) Logical address space and physical address space. ii) Internal fragmentation and external fragmentation. iii) Paging and segmentation.
17.	With a supporting paging hardware, explain in detail concept of paging with an example for a 32-byte memory with 4-type pages with a process being 16-bytes. How many bits are reserved for page number and page offset in the logical address. Suppose the logical address is 5, calculate the corresponding physical address, after populating memory and page table.
18.	Given memory partitions of 100K,500K,200K,300K and 600K, apply first fit and best fit algorithm to place 212K,417 K,112 K and 426 K.
19.	Explain with the help of supporting hardware diagram how the TLB improves the performance of a demand paging system.
	What are the draw backs of contiguous memory allocation?
	What is swapping? Does this increase the operating systems overhead? Justify your answer.

MODULE 5

Q.no	Questions
1.	Explain the various Disk scheduling algorithms with example.
2.a.	Point out and explain briefly the problems with RAID
b.	Explain Access Matrix method of system protection.
3.	What is disk scheduling? Explain the following with diagram: i) FCFS ii) SSTF iii) SCAN.
4.	What is an access matrix? Explain the following operations in access matrix with an example for each: i) Copy ii) Transfer iii) Limited copy
5.	Suppose the position of cylinder is at 53. The disk drive has cylinders numbered from 0-199. The queue of pending requests in FIFO order is: 98,183,37,122,14,124,65,67. Starting from the current head position, what is the total distance traveled (in cylinders) by the disk arm to satisfy the requests using algorithms FCFS, SSTF, SCAN and LOOK. Illustrate with figures in each case.
6.	Describe the access matrix model used for protection purpose.
7.a.	What are boot block and bad blocks? Explain.
b.	Explain the goals and principles of protection.
8.	Explain the difference between protection and security? Describe the scheme of capability lists to implement protection
9.	Write short notes on: i) Swap space management ii) Revocation of access rights.
10.	A drive has 5000 cylinders numbered 0 to 4999. The drive is currently serving a request at 143 and previously serviced a request at 125. The queue of pending requests in FIFO order is : 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 starting from current head position, what is total distance travelled(in cylinders) by disk arm to satisfy the requests using FCFS,SSTF,SCAN and look algorithms.
11.	Explain SCAN and C-SCAN disk scheduling.
12.a.	Explain the various components of a Linux system.
b.	Explain process scheduling in a Linux system.
c.	Explain file systems implementation in Linux.
13.	Discuss how memory management is dealt with in Linux operating system.
14.	Write short note on: a) process management in Linux. b) Linux filesystem. c) Benefits of multi- threading. d) Inter-process communication.
15.	Write a short note on Linux virtual memory system.
16.	Write short notes on : a. Linux history b. Components of a Linux system.
17.	Explain the Linux device drive block structure.
18.	What are the design principles of Linux operating systems? Explain

CITY ENGINEERING COLLEGE
DEPARTMENT OF CSE/ISE/ALML
ASSIGNMENT 1

SUBJECT - OPERATING SYSTEMS
SEMESTER - IV

SUB CODE: 21CS44
SECTION: A,B,C,D

1. Draw Gantt charts using the following scheduling algorithms :FCFS,SJF, SRTF,RR,(quantum=2), for the following set of processes. Also calculate .The average waiting time and average turn around time.

i.

Process	Arrival Time	Burst Time
P1	0	6
P2	1	3
P3	2	1
P4	3	4

ii.

Process	Arrival Time	Burst Time
P1	0	9
P2	1	4
P3	2	9
P4	3	5

iii

Process	Arrival Time	Burst Time
P1	0	6
P2	2	3
P3	4	3
P4	5	5

2. Draw Gantt charts using the following scheduling algorithms :FCFS,SJF, SRTF,RR,Priority (quantum=2,higher the number higher the priority) for the following set of processes. Also calculate The average waiting time and average turn around time.

i.

Process	Arrival Time	Burst Time	Priority
P1	0	10	3
P2	0	1	1
P3	3	2	3
P4	5	1	4
P5	10	5	2

ii.

Process	Arrival Time	Burst Time	Priority
P1	0	10	10
P2	0	1	20
P3	1	2	40
P4	2	4	30
P5	2	3	50

iii.

Process	Arrival Time	Burst Time	Priority
P1	0	9	3
P2	0	5	1
P3	2	6	5
P4	3	7	2

3. Apply banker's algorithm to answer the following
- What is the content of need matrix?
 - Is the system in a safe state?
 - If a request from a process P2(0 0 2) arrives, can it be granted?

Process	allocation			maximum			available		
	A	B	C	A	B	C	A	B	C
P0	0	0	2	0	0	4	1	0	2
P1	1	0	0	2	0	1			
P2	1	3	5	1	3	7			
P3	6	3	2	8	4	2			
P4	1	4	3	1	5	7			

4. Find the safe sequence using banker's algorithm. the number of resource units are A,B,C which are 7,7,10 respectively.

Process	allocation			maximum			available		
	A	B	C	A	B	C	A	B	C
P0	2	2	3	3	6	8			
P1	2	0	3	4	3	3			
P2	1	2	4	3	4	4			

5. Apply banker's algorithm to answer the following
- What is the content of need matrix?
 - Is the system in a safe state?
 - If a request from a process P1(0 4 2 0) arrives, can it be granted?

Process	allocation				maximum				available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

CITY ENGINEERING COLLEGE
DEPARTMENT OF CSE/ISE/AIML
ASSIGNMENT 2

SUBJECT - OPERATING SYSTEMS

SUB CODE: 21CS44

SEMESTER - IV

SECTION: A,B,C,D

1. for the given reference string 7,0,1,2,3,0,3,0,4,2,3,0,3,2,1,2,0,7,1,0 assuming frame size if 4, apply FIFO,OPTIMAL,LRU algorithms. find which algorithm is efficient.
2. Consider the page reference string 1,0,7,1,0,2,3,0,3,2,4,0,3,6,2,1 for a memory with 3 frames.determine the number of page faults using FIFO,OPTIMAL,LRU replacement algorithms.which algorithm is most efficient.
3. For the following page reference string 1,2,3,4,1,2,5,1,2,3,4,5 calculate the page faults using FIFO and LRU for memory with 3 and 4 frames.
- 4.Consider the following page reference string 7,0,1,2,0,3,0,4,2,3,0.calculate the number of page faults,when the number of page frame is 3,using FIFO and LRU page replacement algorithms
- 5.apply disk scheduling algorithm FCFS,SSTF,SCAN and LOOK for the following cylinders.starting position of cylinder is at 85.pending request in order 92,113,35,67,89,145,198.
- 6.a drive has 5000 cylinders.numbered 0 to 4999.the drive is currently serving a request at 143 and previously serviced request at 125.the queue of pending request in FIFO order is 86,1470,913,1774,948,1509,1022,1750,130.starting from current head positon,what is the total distance travelled by disk arm to satisfy the request using FCFS,SSTF,SCAN,LOOK nad C-LOOK algorithms.
- 7.given the following sequence 95,180,34,119,11,123,62,64 with the head initially at track 50.ending at track 199.what is the total disk traveled by the disk arm to satisfy the request using FCFS,SSTF,LOOK and C-LOOK algorithms.
- 8.Consider a disk queue with request for I/O to blocks on following cylinders in order 98,183,37,122,14,124,65,67.IF THE DISK HEAD IS INITIALLY AT 53.calculate the total head movements,when the following scheduling are used. i) FCFS ii) SSTF
9. Given memory partitions of 100K,500K,200K,300K and 600K.apply first fit and best fit , worst fit algorithm to place 212K,417 K,112 K and 426K.
10. Given memory partitions of 200K,700K,500K,300K,100K,400K. apply first fit and best fit , worst fit algorithm to place 315K,427K,250K,550K.

CITY ENGINEERING COLLEGE
FIRST INTERNAL TEST

Program Name: CSE/ISE/AI&ML

Course Name : Operating Systems

Sem & Sec: IV SEM A, B, C, D

Max Marks: 40

Date: 11/07/2023

Time: 02:30PM – 04:00PM

Duration: 1 ½ hrs.

Note: Answer all Questions selecting any ONE FULL question from each part.

Q No.	SQ No.	Questions	Marks	BT Levels	CO's
<i>PART -A</i>					
1		Define operating systems. With a neat diagram explain the dual mode operation of operating system.	10	BT1, BT2	CO1
<i>Or</i>					
2		Demonstrate the operations of process creation and process termination.	10	BT2	CO1
<i>PART -B</i>					
3		Analyze the following operating system structures with a neat diagram. a) Simple structures b) Microkernel c) Layered approach	10	BT2	CO1
<i>Or</i>					
4		Explain operating system services with respect to user and system.	10	BT2	CO1
<i>PART -C</i>					
5		With a neat diagram explain the concept of virtual machines, with examples.	10	BT2	CO1
<i>Or</i>					
6		With neat diagram explain the following i) Process states ii) Process Control Block.	10	BT2	CO1
<i>PART - D</i>					
7		What are system calls? Briefly explain types of system calls.	10	BT1, BT2	CO1
<i>Or</i>					
8		What is IPC? Explain the Shared Memory and Message Passing IPC in detail.	10	BT1, BT2	CO1

Bloom's Taxonomy Level: BT1-Remembering BT2-Understanding BT3-Appling BT4-Analysing BT5-Evaluating BT6-Creating

Course Outcomes:

- CO 1. Identify the structure of an operating system and its scheduling mechanism.
- CO 2. Demonstrate the allocation of resources for a process using scheduling algorithm.
- CO 3. Identify root causes of deadlock and provide the solution for deadlock elimination
- CO 4. Explore about the storage structures and learn about the Linux Operating system.
- CO 5. Analyze Storage Structures and Implement Customized Case study

CITY ENGINEERIN COLLEGE
DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test I

Semester & Section: IV (A,B,C,D)

Date: 11/7/23

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<p style="text-align: center;"><u>Part - A</u></p> <p>defination of OS dual-mode operation</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">User process</p> <pre> graph LR subgraph User_Process [User process] direction LR A[user process executing] -- calls system calls --> B[return from system call] end subgraph Kernel [kernel] direction TB C[execute system call] end B -- "mode bit = 1" --> C C -- "mode bit = 0" --> A </pre> </div>	<p>2M 8M</p>	<p>10M</p>
2.	<p>process operations <u>process creation:</u></p> <pre> int main() { pid_t pid; pid = fork(); if (pid < 0) { printf(stderr, "fork failed"); exit(-1); } else if (pid == 0) { execlp("/bin/ls", "ls", NULL); } else { wait(NULL); printf("Child complete"); exit(0); } } </pre>	<p>5M</p>	

- two possibilities in terms of execution
 - two possibilities in terms of address space
- process termination.

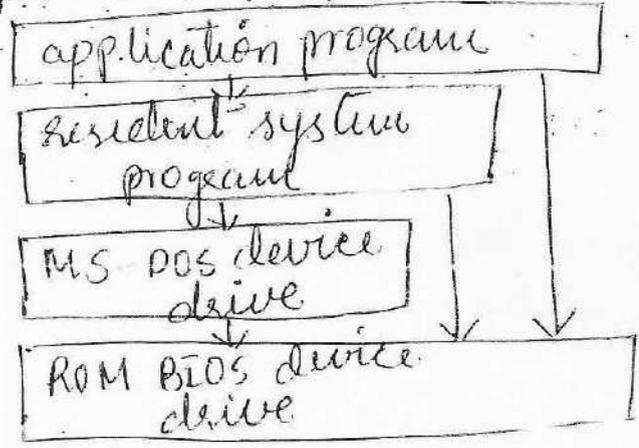
5M

10M

- Reasons for process termination
- child has exceeded usage of allocated resources
 - Task assigned to child is no longer required
 - If parent exits, OS do not allow parent to continue.

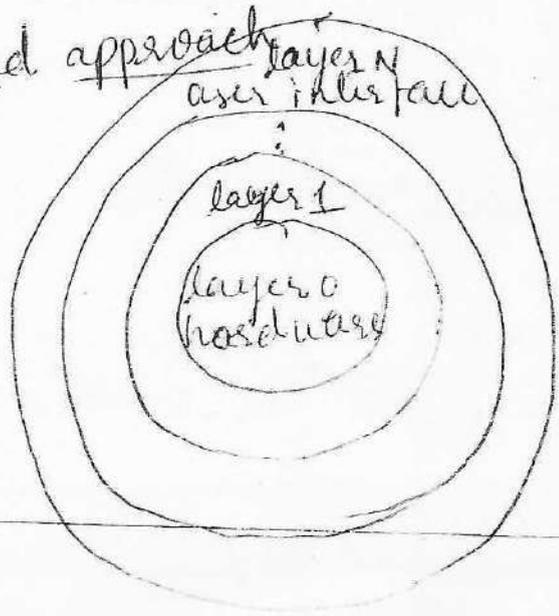
PART - B

3. operating system structures
1. Simple structures



4M

2. layered approach



3M

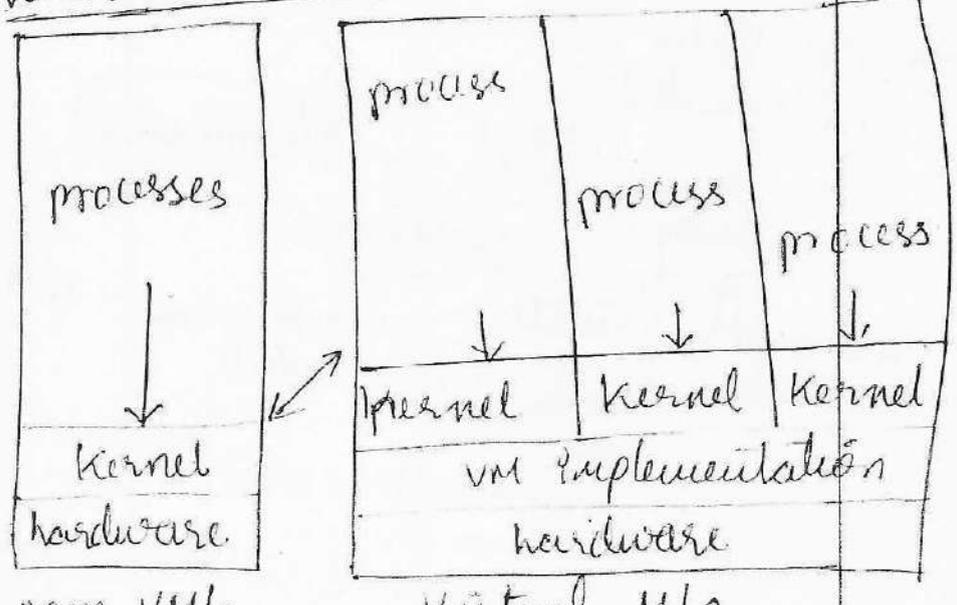
CITY ENGINEERING COLLEGE
DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test I

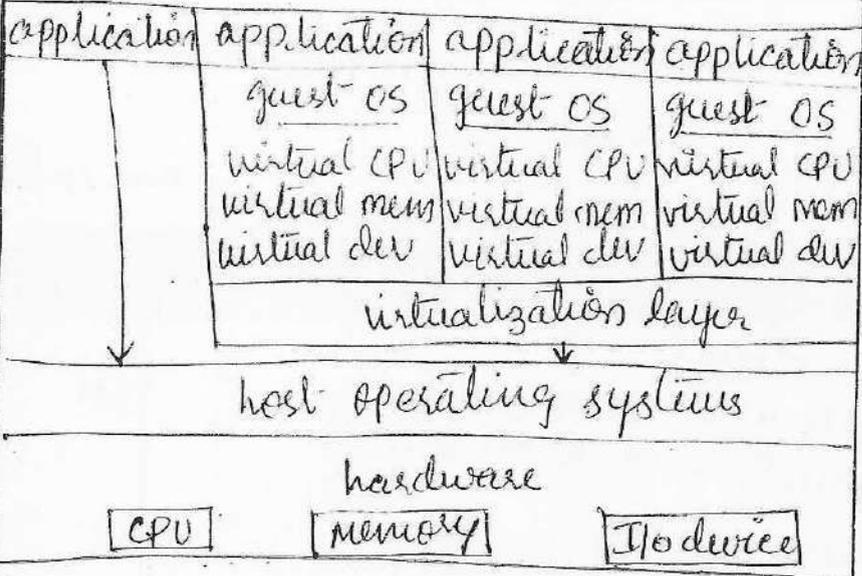
Semester & Section: IV (A, B, C, D)

Date: 11/7/23

Question No.	Details of the Answer	Marks Distribution	Total Marks
3)	<u>micro kernels</u> security and reliability probability and modularity	3M	10M
4.	<u>operating system services</u> 1. user interface 2. program execution 3. I/O operation 4. file system manipulation 5. communication 6. error detection	7 resource allocation 8. accounting 9. protection and security 10M	10M
<u>PART C</u>			
5.	<u>Virtual machines</u> 		4M

Question No.	Detail	Mark	Time
--------------	--------	------	------

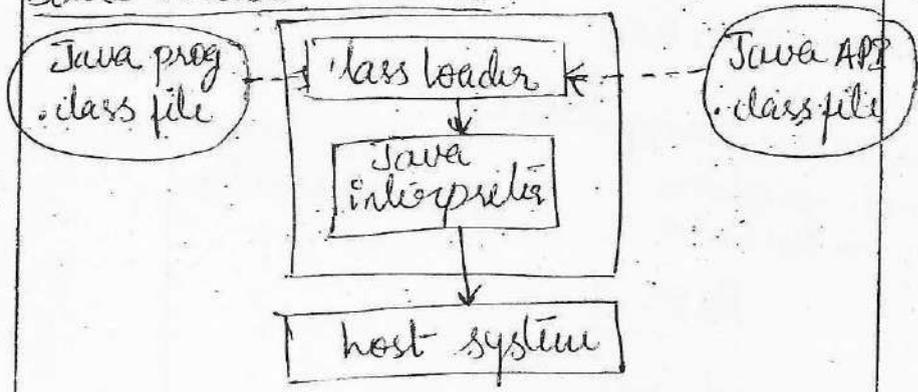
1) VMware



3M

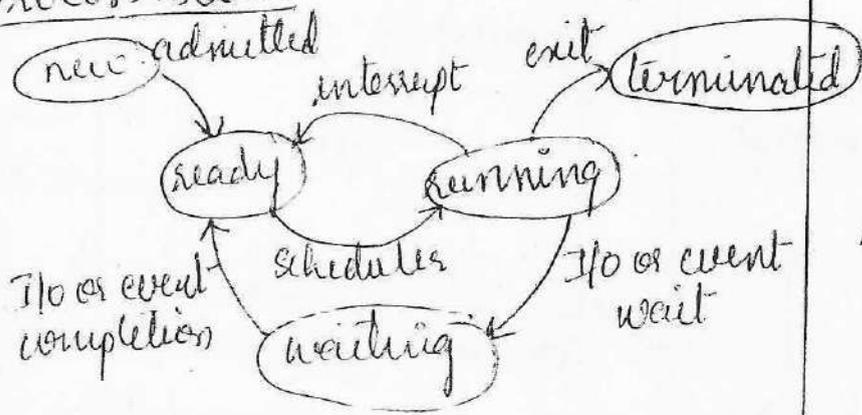
10M

Java virtual machine



3M

6. Process states



5M

CITY ENGINEERIN COLLEGE
DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test I

Semester & Section: IV (A, B, C, D)

Date: 11/7/23

Question No.	Details of the Answer	Marks Distribution	Total Marks							
	<p><u>process control block:</u></p> <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>process status</td></tr> <tr><td>process number</td></tr> <tr><td>program counter</td></tr> <tr><td>register</td></tr> <tr><td>memory limits</td></tr> <tr><td>list of files</td></tr> <tr><td>...</td></tr> </table> <ul style="list-style-type: none"> • process status • program counter • CPU register • CPU scheduling information • memory mang. • accounting info. • I/O status inform. • Threads 	process status	process number	program counter	register	memory limits	list of files	...	5M	10M
process status										
process number										
program counter										
register										
memory limits										
list of files										
...										
7.	<p style="text-align: center;"><u>PART-D</u></p> <p><u>system calls</u></p> <p>The diagram shows a horizontal bar representing the 'system call interface' between 'user mode' (top) and 'kernel mode' (bottom). In user mode, a 'user application' box has an arrow labeled 'open()' pointing down to the interface. In kernel mode, there is a vertical box representing the kernel's internal state, with an arrow pointing up to the interface. To the right of the interface, the text reads: 'open() implementation of open() system call' followed by a vertical ellipsis and the word 'return'.</p>	5M								

Types of system calls

1. process control
2. file management
3. device management
4. Information maintenance
5. communication

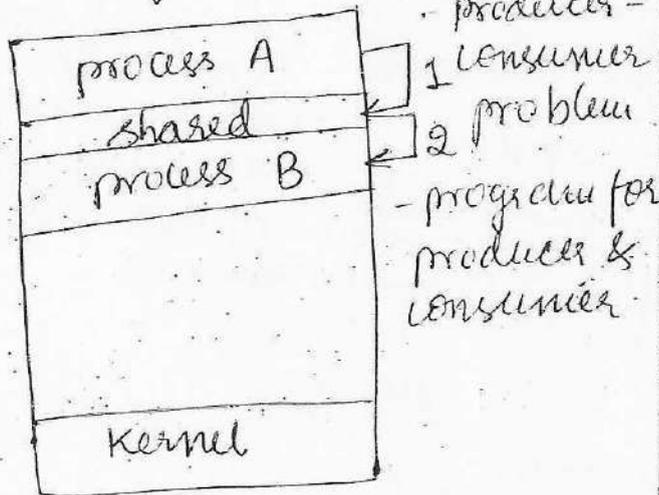
5M

10M

8. definition of IPC

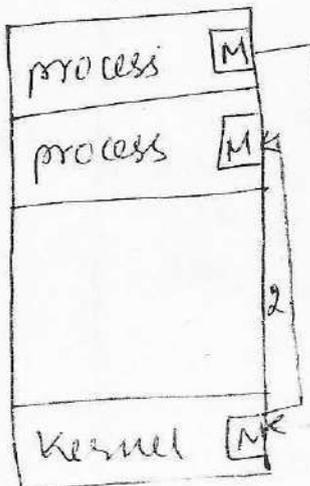
2M

1. Shared memory



4M

2. Message passing



- naming
- direct: → send(P, message)
- indirect: → send(A, message)
- receive(B, message)
- receive(A, message)
- synchronization
- blocking send
- non-blocking send
- blocking receive
- non-blocking receive
- buffering
- zero capacity
- Bounded capacity
- unbounded capacity

10M

4M

**CITY ENGINEERING COLLEGE
SECOND INTERNAL TEST**

Program Name: CSE/ISE/AI&ML
Course Name : Operating Systems
Sem & Sec: IV SEM A, B, C, D

Max Marks: 40

Date: 11/08/2023
Time: 10:30AM - 12:00PM
Duration: 1 ½ hrs.

Note: Answer all Questions selecting any ONE FULL question from each part.

Q No.	SQ No.	Questions	Marks	BT Levels	CO's																																																																																										
PART - A																																																																																															
1		What are Threads and Benefits of Multithreads? Explain different multithreading models.	10	BT1, BT2	CO2																																																																																										
<i>Or</i>																																																																																															
2		Discuss briefly different threading issues.	10	BT2	CO2																																																																																										
PART - B																																																																																															
3		Explain Multilevel Queue scheduling and Multilevel Feedback-Queue scheduling.	10	BT2	CO2																																																																																										
<i>Or</i>																																																																																															
4		Draw Gantt charts using the following scheduling algorithms: FCFS, SJF, SRTF, RR, Priority (Quantum=2, Higher the number higher the priority) for the following set of processes. Also calculate the average waiting time and average turnaround time. <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th>Process</th> <th>Arrival Time</th> <th>Burst Time</th> <th>Priority</th> </tr> </thead> <tbody> <tr><td>P1</td><td>0</td><td>10</td><td>10</td></tr> <tr><td>P2</td><td>0</td><td>1</td><td>20</td></tr> <tr><td>P3</td><td>1</td><td>2</td><td>40</td></tr> <tr><td>P4</td><td>2</td><td>4</td><td>30</td></tr> <tr><td>P5</td><td>2</td><td>3</td><td>50</td></tr> </tbody> </table>	Process	Arrival Time	Burst Time	Priority	P1	0	10	10	P2	0	1	20	P3	1	2	40	P4	2	4	30	P5	2	3	50	10	BT3	CO2																																																																		
Process	Arrival Time	Burst Time	Priority																																																																																												
P1	0	10	10																																																																																												
P2	0	1	20																																																																																												
P3	1	2	40																																																																																												
P4	2	4	30																																																																																												
P5	2	3	50																																																																																												
PART - C																																																																																															
5		Explain the deadlock prevention methods in detail.	10	BT2	CO3																																																																																										
<i>Or</i>																																																																																															
6		Apply banker's algorithm to answer the following <ol style="list-style-type: none"> What is the content of need matrix? Is the system in a safe state? If a request from a process P1(0 4 2 0) arrives, can it be granted? <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Process</th> <th colspan="4">Allocation</th> <th colspan="4">Maximum</th> <th colspan="4">Available</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>P0</td> <td>0</td> <td>0</td> <td>1</td> <td>2</td> <td>0</td> <td>0</td> <td>1</td> <td>2</td> <td>1</td> <td>5</td> <td>2</td> <td>0</td> </tr> <tr> <td>P1</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>7</td> <td>5</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P2</td> <td>1</td> <td>3</td> <td>5</td> <td>4</td> <td>2</td> <td>3</td> <td>5</td> <td>6</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P3</td> <td>0</td> <td>6</td> <td>3</td> <td>2</td> <td>0</td> <td>6</td> <td>5</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P4</td> <td>0</td> <td>0</td> <td>1</td> <td>4</td> <td>0</td> <td>6</td> <td>5</td> <td>6</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Process	Allocation				Maximum				Available				A	B	C	D	A	B	C	D	A	B	C	D	P0	0	0	1	2	0	0	1	2	1	5	2	0	P1	1	0	0	0	1	7	5	0					P2	1	3	5	4	2	3	5	6					P3	0	6	3	2	0	6	5	2					P4	0	0	1	4	0	6	5	6					10	BT3	CO3
Process	Allocation				Maximum				Available																																																																																						
	A	B	C	D	A	B	C	D	A	B	C	D																																																																																			
P0	0	0	1	2	0	0	1	2	1	5	2	0																																																																																			
P1	1	0	0	0	1	7	5	0																																																																																							
P2	1	3	5	4	2	3	5	6																																																																																							
P3	0	6	3	2	0	6	5	2																																																																																							
P4	0	0	1	4	0	6	5	6																																																																																							

PART - D

7	How deadlock can be detected when there is i) a single instance of each resource type ii) multiple instances of each resource type	40	BT1, BT2	CO3
<i>Or</i>				
8	a. What are deadlocks? What is Resource Allocation Graph(RAG)? Explain how RAG is very useful in describing dead lock by Considering your own example. b. Explain the necessary conditions for its occurrence.	10	BT1, BT2	CO3

Bloom's Taxonomy Level: BT1-Remembering BT2-Understanding BT3-Applying BT4-Analysing BT5-Evaluating BT6-Creating

Course Outcomes:

- CO 1. Identify the structure of an operating system and its scheduling mechanism.
- CO 2. Demonstrate the allocation of resources for a process using scheduling algorithm.
- CO 3. Identify root causes of deadlock and provide the solution for deadlock elimination
- CO 4. Explore about the storage structures and learn about the Linux Operating system.
- CO 5. Analyze Storage Structures and Implement Customized Case study

CITY ENGINEERING COLLEGE

DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test II

Semester & Section: IV - A, B, C & D

Date: 10/8/23

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
	<u>Part - A</u>		
1.	<p>A thread is a basic unit of CPU utilization.</p> <p>Thread - flow of control within a process</p> <p>Benefits of multithread</p> <ul style="list-style-type: none"> ↳ Responsiveness. ↳ Resource sharing ↳ Economy ↳ Utilization of multiprocessor architecture. <p>Multithreading Models</p> <ul style="list-style-type: none"> ↳ Many to one ↳ One-to-one ↳ Many to many 	<p style="text-align: right;">1M</p> <p style="text-align: right;">4x1 = 4M</p> <p style="text-align: right;">5M</p>	10M.
2.	<p><u>Threading Issues</u></p> <ul style="list-style-type: none"> ↳ Executing fork() and exec() ↳ Thread cancellation <ul style="list-style-type: none"> ↳ Asynchronous ↳ Deferred ↳ Signal handling ↳ Thread Pools ↳ Thread specific data ↳ Scheduler activations 	<p style="text-align: right;">Any 5 points</p> <p style="text-align: right;">5x2 = 10M</p>	10M

Staff Aul

HOD

Question No	Details of the Answer	Marks Total Distribution	Total Marks
-------------	-----------------------	--------------------------	-------------

Part - B.

3.

Multi-level queue scheduling

- * partitions ready queue into several separate queues.
- * processes are permanently assigned to one queue.
- * Each queue has its own scheduling algorithm

Explanation with example - 5M

Multi-level feedback queue scheduling

- * Allows processes to move between the queues.
- * Separate processes according to the characteristics of their CPU bursts.
- * prevents starvation.

Explanation with example - 5M

10M

4.

FCFS.

	P ₁	P ₂	P ₃	P ₄	P ₅
0		10	11	13	17
	AT	BT	CT	TAT	WT
P ₁	0	10	10	10	0
P ₂	0	1	11	11	10
P ₃	1	2	13	12	10
P ₄	2	4	17	15	11
P ₅	2	3	20	18	15

$$\text{Avg. TAT} = \frac{10 + 11 + 12 + 15 + 18}{5} = \underline{\underline{13.2}}$$

$$\text{Avg WT} = \frac{0 + 10 + 10 + 11 + 15}{5} = \underline{\underline{9.2}}$$

CITY ENGINEERING COLLEGE

DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test II

Semester & Section: IV A, B, C, & D

Date: 10/8/23

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
--------------	-----------------------	--------------------------	-------------

SJF

P ₂	P ₃	P ₅	P ₄	P ₁
0	1	3	6	10
				20

$$\text{Avg TAT} = \frac{20 + 1 + 2 + 8 + 4}{5} = \underline{\underline{7}}$$

$$\text{Avg W.T} = \frac{10 + 0 + 0 + 4 + 1}{5} = \underline{\underline{3}}$$

SRTF

Same as SJF

Round Robin Quantum = 2ms.

P ₁	P ₂	P ₃	P ₄	P ₅	P ₁	P ₄	P ₅	P ₁	P ₁	P ₁
0	2	3	5	7	9	11	13	14	16	18
20										

	CT	TAT	W.T
P ₁	20	20	10
P ₂	3	3	2
P ₃	5	4	2
P ₄	13	11	7
P ₅	14	12	9

$$\text{Avg. T.A.T} = \frac{20 + 3 + 4 + 11 + 12}{5} = \underline{\underline{10}}$$

$$\text{Avg W.T} = \frac{10 + 2 + 2 + 7 + 9}{5} = \underline{\underline{6}}$$

Staff Aeil

HOD

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
--------------	-----------------------	--------------------------	-------------

Priority Scheduling.

	P ₂	P ₃	P ₅	P ₃	P ₄	P ₁
	1	2	5	6	10	20
	AT	CT	TAT	B.T	W.T	
P ₁	0	20	20	10	10	
P ₂	0	1	1	1	0	
P ₃	1	6	5	2	3	
P ₄	2	10	8	4	4	
P ₅	2	5	3	3	0	

$$\text{Avg. T.A.T} = \frac{20+1+5+8+3}{5} = 7.4$$

$$\text{Avg. W.T} = \frac{10+0+3+4+0}{5} = 3.4$$

10M.

Each one carries 2M. $5 \times 2 = 10M$

Part-c.

5. Deadlock prevention methods by ensuring one of the following conditions cannot occur.

↳ Mutual exclusion - must hold for nonsharable resources. Sharable resources, do not require mutually exclusive access.

↳ Hold and wait

Each process to request must be allocated all its resources before it begins execution

Allow a process to request resources only when it has none.

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
--------------	-----------------------	--------------------------	-------------

↳ Circular wait - Impose a total ordering of all resource types and to require that each process requests resources in an increasing order of enumeration

↳ NO preemption -

*If a process is holding and requesting some other resources that cannot be immediately allocated, then preempt all resources currently being held.

*If requested resources are held by waiting process, then preempt the resources from waiting process,

Each carries $2\frac{1}{2}$ M

$4 \times 2\frac{1}{2}$ M

10M

6.

	Allocation				Maximum				Available				Need			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
P ₀	0	0	1	2	0	0	1	2	1	5	2	0	0	0	0	0
P ₁	1	0	0	0	1	7	5	0					0	7	5	0
P ₂	1	3	5	4	2	3	5	6					1	0	0	2
P ₃	0	6	3	2	0	6	5	2					0	0	2	0
P ₄	0	0	1	4	0	6	5	6					0	6	4	2
	- 4M															

b. System is in a safe state with

Safe sequence P₀, P₂, P₃, P₄, P₁ - 1M

c. If a request from a P₁(0, 4, 2, 0) arrives

	Allocation				Maximum				Available				Need			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
P ₀	0	0	1	2	0	0	1	2	1	1	0	0	0	0	0	0
P ₁	1	4	2	0	1	7	5	0					0	3	3	0
P ₂	1	3	5	4	2	3	5	6					1	0	0	2
P ₃	0	6	3	2	0	6	5	2					0	0	2	0
P ₄	0	0	1	4	0	6	5	6					0	6	4	2
	- 4M															

Request can be granted

1M

10M

CITY ENGINEERING COLLEGE

DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test II

Semester & Section: IV - A, B, C & D

Date: 10/8/23

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
7.	<p>i) <u>Deadlock detection</u> when there is a single instance of resource type Use resource allocation graph convert it to wait for graph If cycle present deadlock occurred</p> <p>ii) Several instances of resource type Deadlock can be detected by applying resource-request algorithm.</p>	<p style="text-align: center;"><u>part - B</u></p> <p style="text-align: right;">- 4M</p> <p style="text-align: right;">- 6M</p>	<p style="font-size: 2em;">}</p> <p style="text-align: center;">10M</p>
8. a.	<p>Deadlock - when two or more processes waiting indefinitely for an event that can be caused only by one of the waiting processes.</p> <p>Resource allocation graph - directed graph describes deadlock Explanation with example to describe a deadlock</p>	<p style="text-align: right;">- 1M</p> <p style="text-align: right;">- 5M</p>	<p style="font-size: 2em;">}</p> <p style="text-align: center;">6M</p>
8. b.	<p>Necessary conditions for deadlock</p> <ol style="list-style-type: none"> 1) Mutual exclusion 2) Hold and wait 3) No preemption 4) circular wait 	<p style="text-align: right;">- 4x1M</p>	<p style="text-align: right;">- 4M.</p>

Staff Arun

HOD

Q. No.

**CITY ENGINEERING COLLEGE
THIRD INTERNAL TEST**

Program Name: CSE/ISE/AI&ML
Course Name : Operating Systems
Sem & Sec: IV SEM A, B, C, D

Max Marks: 40

Date: 7/09/2023
Time: 10:30 AM - 12:00 PM
Duration: 1 ½ hrs.

Note: Answer all Questions selecting any ONE FULL question from each part.

Q No.	SQ No.	Questions	Marks	BT Levels	CO's
<i>PART - A</i>					
1		Discuss paging with an example.	10	BT1, BT2	CO4
<i>Or</i>					
2		a. Given memory partitions of 100K, 500K, 200K, 300K and 600K, apply first fit and best fit, worst fit algorithm to place 212K, 417K, 112K and 426K. b. A drive has 200 cylinders numbered 0 to 199. Given the following sequences 98, 183, 37, 122, 14, 124, 65, 67 with the head initially at track 53. calculate the total head movements when the following scheduling algorithms are used i) FCFS ii) SCAN iii) LOOK	10	BT2	CO4, CO5
<i>PART - B</i>					
3		Explain with the help of supporting hardware diagram how the TLB improves the performance of a demand paging system.	10	BT2	CO4
<i>Or</i>					
4		Write a short notes on: a. Segmentation b. Steps in handling page fault.	10	BT3	CO4
<i>PART - C</i>					
5		Discuss on the performance of demand paging.	10	BT2	CO4
<i>Or</i>					
6		Consider the following page reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. Assuming there are 3 memory frames, how many faults would occur in the case of i) FCFS ii) Optimal iii) LRU algorithm. Note that initially all frames are empty.	10	BT3	CO4
<i>PART - D</i>					
7		Explain the various access method of files.	10	BT1, BT2	CO4
<i>Or</i>					
8		Describe the various directory structures.	10	BT1, BT2	CO4

Bloom's Taxonomy Level: BT1-Remembering BT2-Understanding BT3-Applying BT4-Analysing BT5-Evaluating BT6-Creating

Course Outcomes:

CO 1. Identify the structure of an operating system and its scheduling mechanism.
CO 2. Demonstrate the allocation of resources for a process using scheduling algorithm.
CO 3. Identify root causes of deadlock and provide the solution for deadlock elimination
CO 4. Explore about the storage structures and learn about the Linux Operating system.
CO 5. Analyze Storage Structures and Implement Customized Case study

CITY ENGINEERING COLLEGE
DEPARTMENT OF C.S.E.....

OPERATING SYSTEMS
SCHEME FOR VALUATION

Internal Test III

Semester & Section: 4th Sem (A,B,C,D)

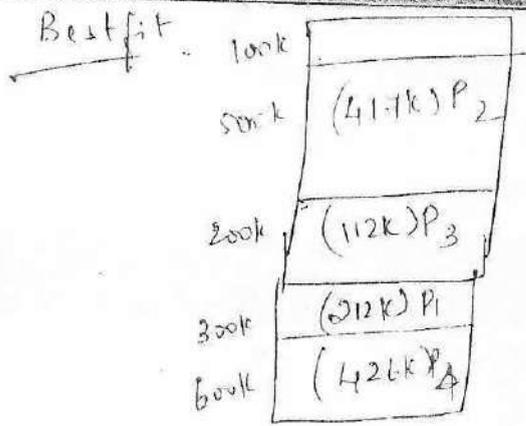
Date: 7/9/23

Question No.	Details of the Answer	Marks Distribution	Total Marks																																												
PART A 1.	<p>Discuss paging with example</p> <p>Paging definition.</p> <p>Basic method - explanation</p> <p>Page number, page offset</p> <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td style="width: 50px; text-align: center;">p</td> <td style="width: 50px; text-align: center;">d</td> </tr> <tr> <td style="text-align: center;">$m-n$</td> <td style="text-align: center;">n</td> </tr> </table> </div> <p>paging example with explanation</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <table border="1" style="border-collapse: collapse;"> <tr><td>0</td><td>a</td></tr> <tr><td>1</td><td>b</td></tr> <tr><td>3</td><td>d</td></tr> <tr><td>4</td><td>e</td></tr> <tr><td>5</td><td>f</td></tr> <tr><td>6</td><td>g</td></tr> <tr><td>7</td><td>h</td></tr> </table> <table border="1" style="border-collapse: collapse;"> <tr><td>0</td><td>5</td></tr> <tr><td>1</td><td>6</td></tr> <tr><td>2</td><td>3</td></tr> <tr><td>3</td><td>2</td></tr> </table> <div style="text-align: center;"> <p>page table</p> <table border="1" style="border-collapse: collapse;"> <tr><td>0</td><td></td></tr> <tr><td>4</td><td></td></tr> <tr><td>8</td><td></td></tr> <tr><td>12</td><td></td></tr> <tr><td>16</td><td></td></tr> <tr><td>20</td><td>a</td></tr> <tr><td></td><td>b</td></tr> <tr><td></td><td>f</td></tr> <tr><td>24</td><td>h</td></tr> </table> </div> </div>	p	d	$m-n$	n	0	a	1	b	3	d	4	e	5	f	6	g	7	h	0	5	1	6	2	3	3	2	0		4		8		12		16		20	a		b		f	24	h	<p>1.</p> <p>3</p> <p>6</p>	<p>10</p> <p>10</p>
p	d																																														
$m-n$	n																																														
0	a																																														
1	b																																														
3	d																																														
4	e																																														
5	f																																														
6	g																																														
7	h																																														
0	5																																														
1	6																																														
2	3																																														
3	2																																														
0																																															
4																																															
8																																															
12																																															
16																																															
20	a																																														
	b																																														
	f																																														
24	h																																														
2.	<p>a. First fit</p> <p>work (212k) P1</p> <p>work (112k) P3</p> <p>work (617k) P2</p> <p style="text-align: right;">P4 → slave</p>	<p>1</p>	<p>10</p>																																												

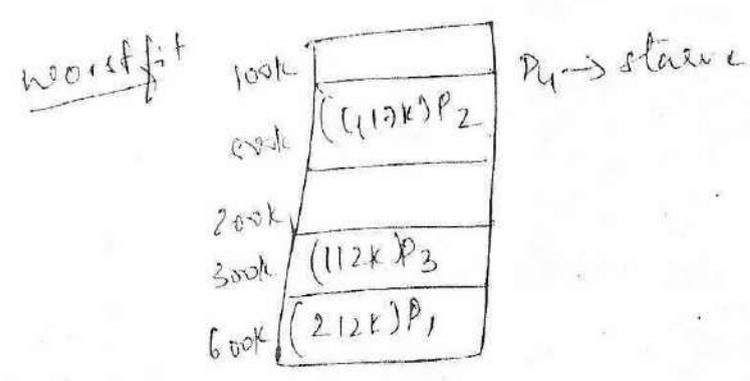
Staff

HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
--------------	-----------------------	--------------------	-------------

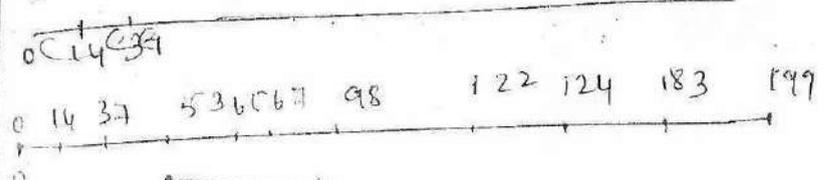


1

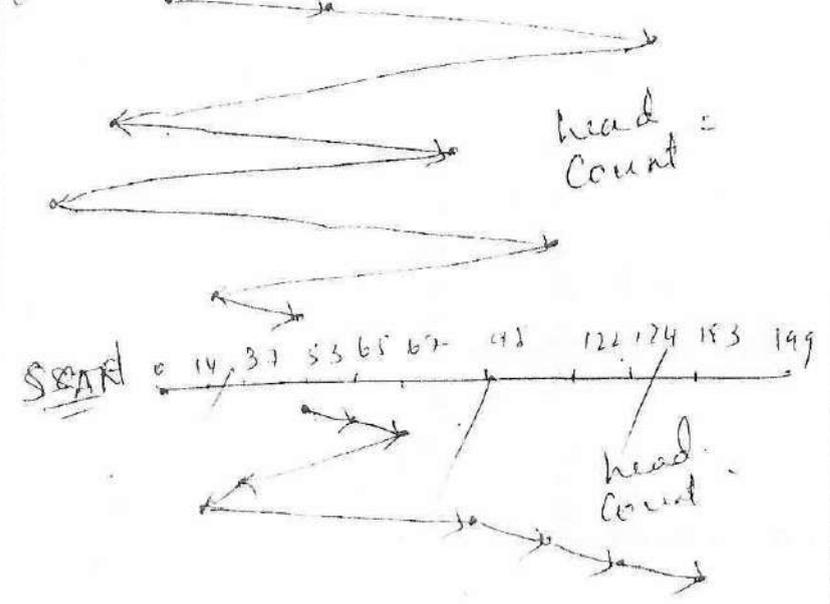


1

b. B. FCFS



2



2

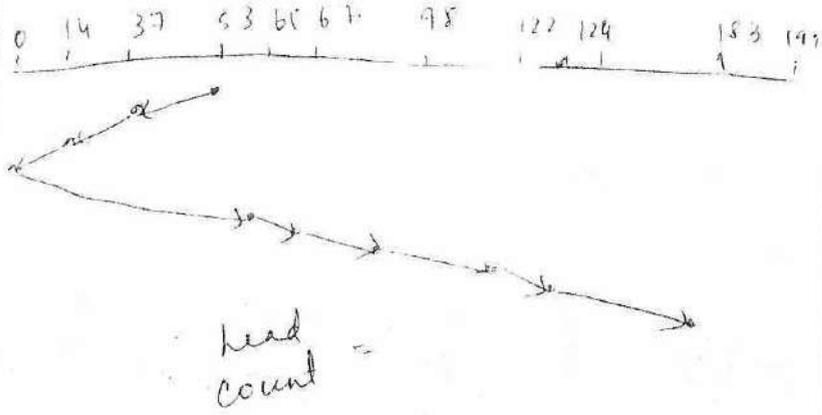
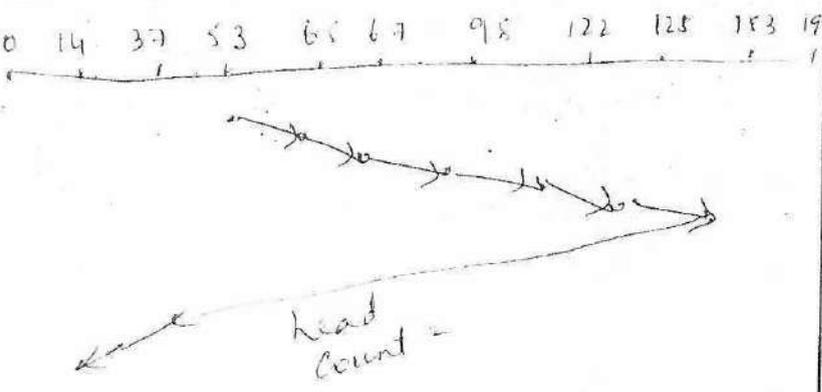
CITY ENGINEERING COLLEGE
DEPARTMENT OF

SCHEME FOR VALUATION

Semester & Section: _____

Internal Test _____

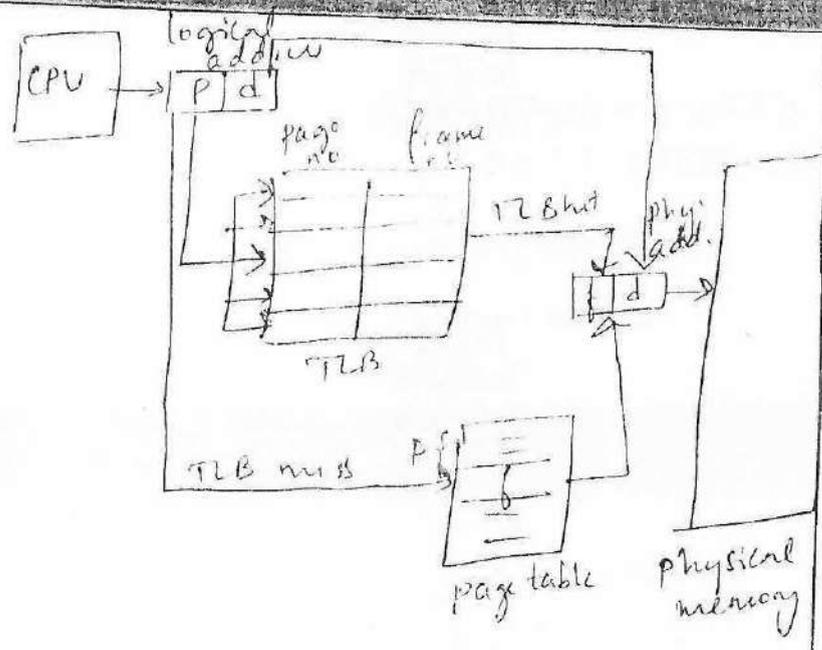
Date: _____

Question No.	Details of the Answer	Marks Distribution	Total Marks
	<p><u>Scan</u></p>  <p><u>Look</u></p> 	<p align="center">2</p> <p align="center">2</p>	
<p>PART B</p> <p>3.</p>	<p>7.4 B — explanation definition explanation of hardware effective memory access Hint.</p>	<p align="center">3</p> <p align="center">4</p> <p align="center">2</p>	<p align="center">10</p>

V. Subramanian
 Staff

[Signature]
 HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
--------------	-----------------------	--------------------	-------------

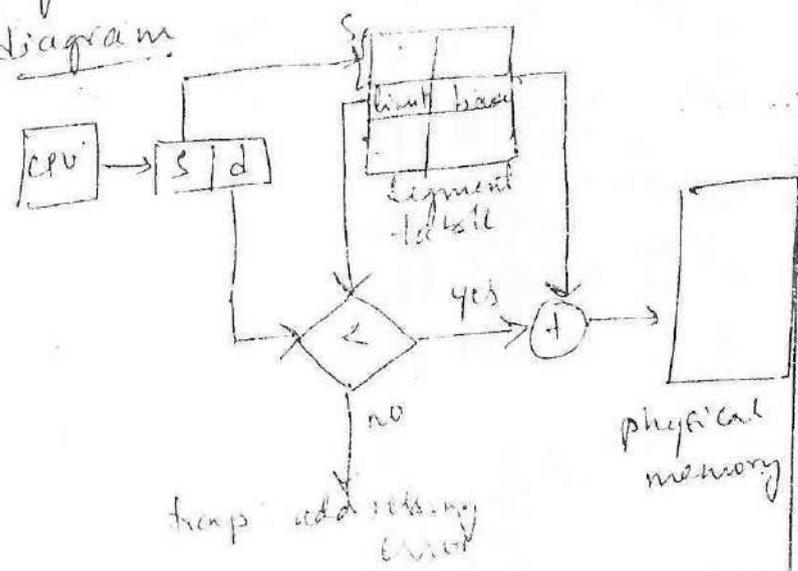


3

4. a. Segmentation

definition

Segmentation w/w explanation -
Diagram



1.
2. 2

~~7.5~~
5.5
10

6. b. Steps in handling page fault

1. check internal table
2. if invalid -> terminate
- if valid and not brought -> page in

5

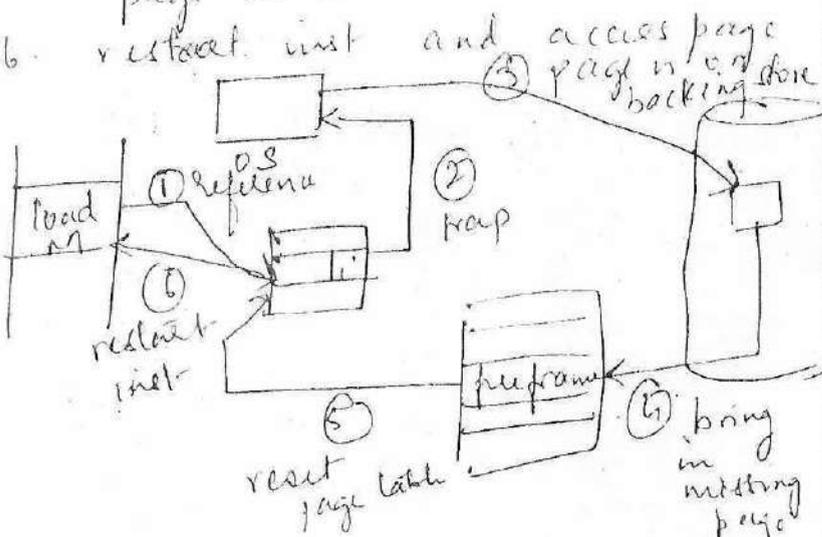
CITY ENGINEERING COLLEGE
DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test _____

Semester & Section: _____

Date: _____

Question No.	Details of the Answer	Marks Distribution	Total Marks
	<p>3. find free frame</p> <p>4. schedule disk op to read page in newly allocated frame</p> <p>5. modify internal table and page table</p> <p>6. restart inst and access page</p>  <p>The diagram illustrates the demand paging process with the following steps:</p> <ol style="list-style-type: none"> ① OS reference ② trap ③ page in core store backing ④ restart inst ⑤ reset page table ⑥ bring in missing page <p>The diagram shows a 'load M' box, a 'OS reference' box, a 'trap' box, a 'page in core store backing' cylinder, a 'restart inst' box, a 'reset page table' box, and a 'bring in missing page' box. Arrows indicate the flow of control and data between these components.</p>	<p align="center">2</p> <p align="center">3</p>	<p align="center">5</p>
<p>PART-C</p> <p>5.</p>	<p>Demand paging definition - 8</p> <p>Basic Concepts is</p> <ul style="list-style-type: none"> → valid - invalid bit scheme → page fault trap → pure demand paging. → performance - effective access time 	<p align="center">1</p> <p align="center">6.</p>	<p align="center">10.</p>

Abhishek K
Staff

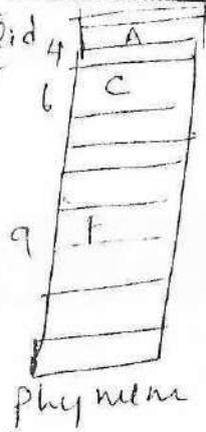
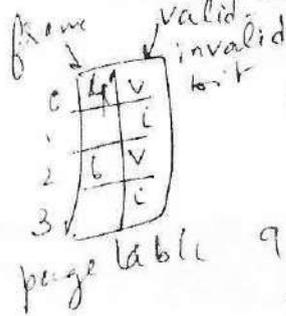
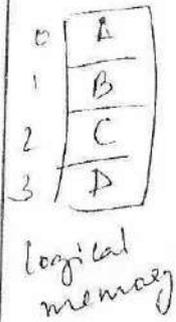
[Signature]
HOD

Question No.

Details of the Answer

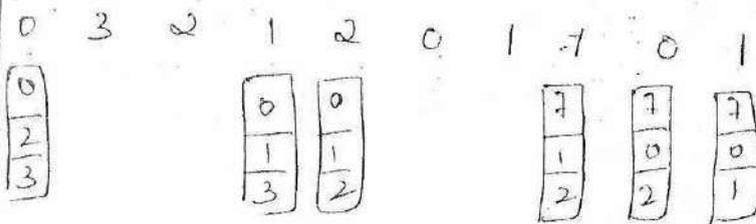
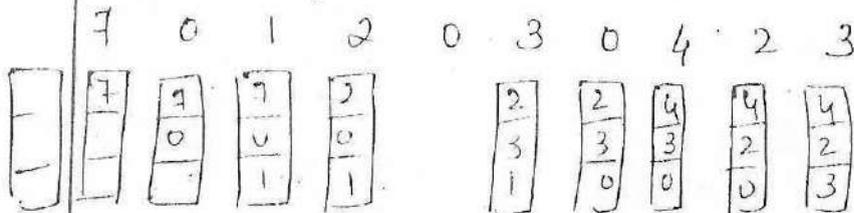
Marks Distribution

Total Marks



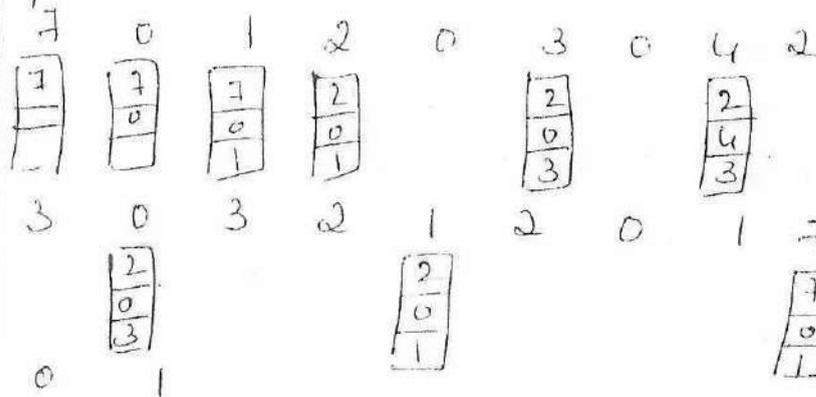
3.

6. FCFS



PF = 16/15

optimal.



PF = 9

⚡

3

CITY ENGINEERING COLLEGE
DEPARTMENT OF

SCHEME FOR VALUATION

Internal Test _____

Semester & Section:

Date:

Question No.	Details of the Answer	Marks Distribution	Total Marks																																				
	<p>CPU</p> <p>7 0 1 2 0 3 0 4 2</p> <p> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>7</td></tr><tr><td>0</td></tr><tr><td>1</td></tr></table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>7</td></tr><tr><td>0</td></tr><tr><td>1</td></tr></table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>7</td></tr><tr><td>0</td></tr><tr><td>1</td></tr></table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>2</td></tr><tr><td>0</td></tr><tr><td>1</td></tr></table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>2</td></tr><tr><td>0</td></tr><tr><td>3</td></tr></table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>4</td></tr><tr><td>0</td></tr><tr><td>3</td></tr></table> <table border="1" style="display: inline-table;"> <tr><td>4</td></tr><tr><td>0</td></tr><tr><td>2</td></tr></table> </p> <p>3 0 3 2 1 2 0 1</p> <p> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>4</td></tr><tr><td>3</td></tr><tr><td>2</td></tr></table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>0</td></tr><tr><td>3</td></tr><tr><td>2</td></tr></table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>1</td></tr><tr><td>3</td></tr><tr><td>2</td></tr></table> <table border="1" style="display: inline-table;"> <tr><td>1</td></tr><tr><td>0</td></tr><tr><td>2</td></tr></table> </p> <p>7 0 1</p> <p> <table border="1" style="display: inline-table;"> <tr><td>7</td></tr><tr><td>0</td></tr><tr><td>7</td></tr></table> </p> <p align="center">PF = 12</p>	7	0	1	7	0	1	7	0	1	2	0	1	2	0	3	4	0	3	4	0	2	4	3	2	0	3	2	1	3	2	1	0	2	7	0	7	5	
7																																							
0																																							
1																																							
7																																							
0																																							
1																																							
7																																							
0																																							
1																																							
2																																							
0																																							
1																																							
2																																							
0																																							
3																																							
4																																							
0																																							
3																																							
4																																							
0																																							
2																																							
4																																							
3																																							
2																																							
0																																							
3																																							
2																																							
1																																							
3																																							
2																																							
1																																							
0																																							
2																																							
7																																							
0																																							
7																																							
PART D 7.	<p>File Access methods</p> <p>Sequential access beginning current position end</p> <p>example read next write next } explanation</p> <p align="center"> </p>	1 3	10																																				

Vishwanath
Staff

[Signature]
HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
--------------	-----------------------	--------------------	-------------

Direct access

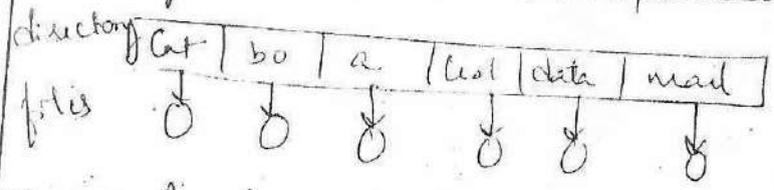
Key access	Implementation	File access
read	$CP = 6$	
read next	$read CP$ $CP = CP + 1$	
write next	$write CP$ $CP = CP + 1$	

explanation

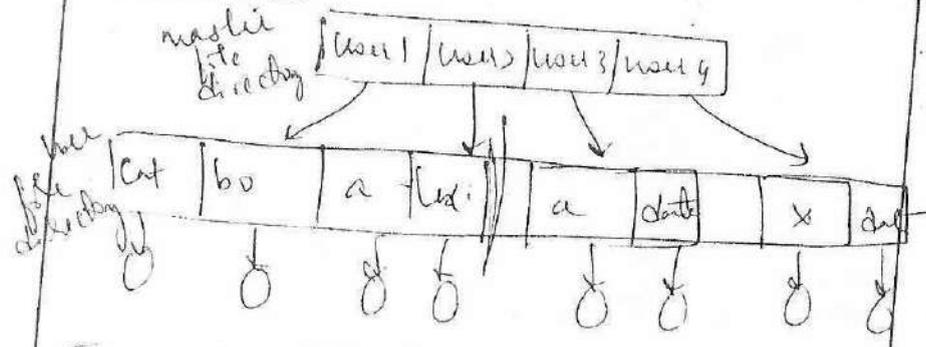
Other access methods
↳ index, example.

2
2
2

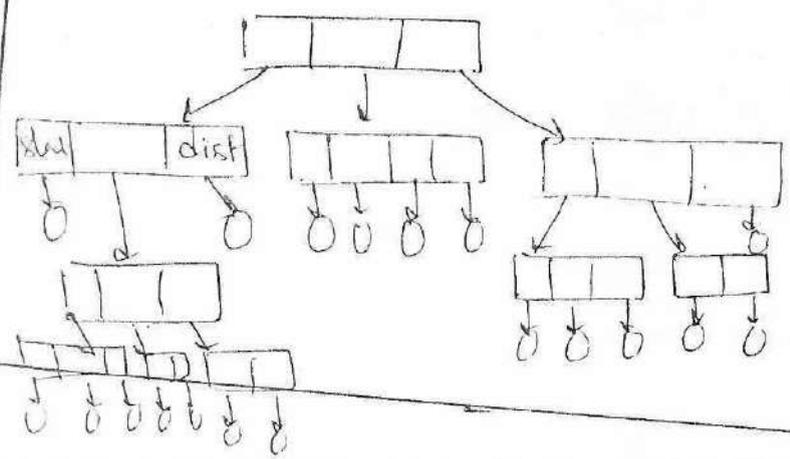
8. Directory Structures
Single level directory
Storage structure → explanation



Two-level



Tree structured



2
1
2

10



CITY
ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

CIRCULAR

Ref No: CEC/ISE/DAC/ACY2022-2023/01

Date: 05-08-2022

This is to inform the members of Department Advisory Committee that meeting is scheduled on 08-08-2022 at 10: 00 AM in ISE department at Lab C001.

Agenda:

- Conduct an orientation for 3th semester students
- Planning of Internships for 5th semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures

HOD & Convener



CITY
ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Department Advisory Committee Meeting

Date: 08/08/2022

Time: 10:00 AM

Venue: Room No. C001

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Dr. N Rajasekher Reddy	HOD	Convenor
2	Mr. Vinod Kumar S.	Assistant Professor	Member
3	Mrs. Swethashree R N	Assistant Professor	Member
4	Mr. Vinod Kumar S.	Assistant Professor	Member
5	Mr. Mahesh Madhavan V	Co-Founder of Mobstac.	(Industry Expert)
6	Mr. Santosh R	Software Engineer Cap Gemini	Alumni

[Handwritten signatures of the members listed in the table]

The Department Advisory Committee meeting is conducted at Department of ISE, on 08th August, 2022, at 10 AM.

Agenda of the Meeting:

- Conduct an orientation for 3rd semester students
- Planning of Internships for 5th semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures.



Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- Committee members suggested establishing MOUs with various IT industries to provide students with internship opportunities.
- It was proposed to conduct a technical symposium with increased student participation.
- The committee decided to organize guest lecture, industry visit, and workshop for students in the 3rd, and 5th, semesters.
- It was discussed to conduct an orientation for third-year students to raise awareness about the 21-Scheme curriculum, particularly regarding registration for NSS, Yoga, or Physical Education.
- The HOD emphasized the importance of projects, Internship and the need to find opportunities for such initiatives.

HOD & Convener



CITY
ENGINEERING COLLEGE

Academic Year: 2021-22 /Odd Sem

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

COURSE PREFERNCE

Name of the Faculty: Dr. N. Rajasekher Reddy

Designation: Professor

Year / Semester: II, III

Sl. No	Course Code and Name	Year/Semester
1	21CS32-Data Structure and Application	II/ III
2	21CS33- Analog and Digital Electronics	II/III
3	18CS55-Application Development Using Python	II/ III
4	18CS556-UNIX Programming	II/III

Signature of faculty



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23(Odd)

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

COURSE ALLOCATION

S.No	Name of the Faculty	Course Code and Name	Yr / Sem	Signature
1	Dr. N. Rajasekher Reddy	21CS32-Data Structure and Application	II/III	
		18CS52-Computer Network and Security	III/V	
2	Dr. Sairabanu	18CS54-Automation Theory and Computation	III/V	
		21CS33- Analog and Digital Electronics	II/III	
3	Mr. Vinod Mr. Vinod	18CS55-Application Development Using Python	III/V	
		18CS556-UNIX Programming	III/V	
		21CSL35- Object Oriented Programming with JAVA Laboratory	II/III	
4	Mrs. Swetharani R	21CS34- Computer Organization and Architecture	II/III	
		18CSL57- Computer Network Laboratory	III/V	
		18CSL58- DBMS Laboratory	III/V	


H

OD, ISE



CITY
ENGINEERING COLLEGE

Academic Year: 2021-22 / Even Sem

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

COURSE PREFERNCE

Name of the Faculty: Dr. N. Rajasekher Reddy

Designation: Professor

Year / Semester: II, IV

Sl. No	Course Code and Name	Year/Semester
1	21CS42: Design and Analysis of Algorithm	II/IV
2	21CS43:Microcontroller and Embedded Systems	II/IV
3	21CS44: Operating System	II/IV

Signature of faculty



ACADEMIC YEAR: 2022-23(Even)

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr. N. Rajasekher Reddy	18CS642-Object Oriented Modelling and Design	III/VI	
2	Dr. Sairabanu	21CS43-Microcontroller and Embedded System	II/IV	
		18CS63-Web technology and its Application	III/VI	
3	Mr. Vinod	18IS62-software Testing	III/VI	
		18CS482-Unix Cell Programming	II/IV	
		18IS166-Software Testing lab	III/VI	
4	Swetharani R/ N	18IS61-FILE STRUCTURES	III/VI	
		21CS42-DAA Lab	II/IV	
		18IS166-SOFTWARE TESTING LABORATORY	III/VI	



HOD, ISE



CITY ENGINEERING COLLEGE

Department of Information Science Engineering

Academy Year 2022-2023

Time Table

III Year/ V Semester

Room: C-202

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	DBMS	ADP	SHORT BREAK	ATC	CNS(T)	LUNCH BREAK	DBMS(T)	DBMS(T)	
TUE	ATC	DBMS		ADP	CNS		DBMS LAB		
WED	UNIX	ATC		CNS	ADP		CNS LAB		
THU	CNS	DBMS		CNS(T)	UNIX		ME	ES	DBMS(T)
FRI	ME	UNIX		DBMS(T)	CNS(T)		ME(T)	ME(T)	
SAT	REMEDIAL CLASSES								

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS51	Management, Entrepreneurship for IT Industry	ME	Dr.Nandakumar A N
2	18CS52	Computer Networks and Security	CNS	Dr. N Rajasekhar Reddy
3	18CS53	Database Management System	DBMS	Mr. Nandish A.C
4	18CS54	Automata Theory and Computability	ATC	Dr. Sairabanu
5	18CS55	Application Development Using Python	ADP	Mr. Vinod Kumar S.
6	18CS56	Unix Programming	UNIX	Mr. Vinod Kumar S.
7	18CSL57	Computer Network Laboratory	CN LAB	Mrs. Swetharani R/ Mrs. Sangeeta Uranakar
8	18CSL58	DBMS Laboratory	DBMS LAB	Ms. Nandish A. C/ Mrs. Swethashree R N
9	18CIV59	Environmental Studies	ES	Mr.JayanthKatte/

Class Teacher: Prof. Nandish. A. C

HOD: Dr. N Rajasekher Reddy

Principal: Dr. H N Thippeswamy



CITY ENGINEERING COLLEGE

Department of Information Science Engineering

Academy Year 2022-2023

Time Table

II Year/III Semester

Room: C-302

DAY	09:00– 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	OOO(T)	DS		OOOs LAB			SCR	SK	
TUE	ADE	MAT31		DS	CO		ADE LAB		
WED	MAT31	DS(T)		ADE	SK		CO		
THU	OOO(T)	DS		MAT31	CO				
FRI	DS(T)	ADE		AE LAB			BK	BK	
SAT	MAT-DIP			NSS YOGA PE					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	21MAT31	Transform Calculus, Fourier Series and Numerical Techniques	MAT31	Prof. Gayathri A
2	21CS32	Data Structure and Applications	DS	Dr. N Rajasekhar Reddy
3	21CS33	Analog and Digital Electronics	ADE	Dr. Sairabanu
4	21CS34	Computer Organization and Architecture	CO	Mr.Nandish.A.C
5	21CSL35	Object Oriented Programming with JAVA Laboratory	LAB	Mr. Vinod Kumar S./ Bhat/Prof. Shashikala H C
6	21SCR36	Social Connect and Responsibilities	SCR	Prof. JayanthKatte
7	21KSK37/21KBK37	Samskrutika Kannada/ Balakekannada	SK/BK	Prof. Deepa
9	21CSL381	Ability Enhancement Course – III Laboratory	AEL	Mr. Rakesh/Mr.Channabasappa/ Mrs. Shruthi V

Class Teacher: Prof. Nandish. A. C

HOD: Dr. N Rajasekher Reddy

Principal: Dr. H N Thippeswamy



CITY ENGINEERING COLLEGE
Department of Information Science Engineering

Academy Year 2022-2023(Odd)

Time Table

Faculty Name: Dr. N Rajasekher Reddy

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM	
MON		DS	SHORT BREAK			LUNCH BREAK				
TUE					CNS					
WED				CNS						
THU	CNS	DS		CNS(T)						
FRI	DS(T)									
SAT										

Dr. N Rajasekher Reddy

HOD, ISE

CITY ENGINEERING COLLEGE



DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING COURSE FILE

Name	Mr. Doreeswamy
Designation	Assistant Professor
Semester	<u>V</u>
Section	A & B
Subject code & Name	Computer Networks & Security (18CS52)
Academic Year	2022-23



CITY

ENGINEERING COLLEGE

VISION

Making Remarkable Contribution by Disseminating Knowledge on Emerging Trends in Engineering and Technology through various Programmes, Innovation and Research so as to Excel in Quality both at National and International level and to provide Career Guidance & Training for Employment.

MISSION

- M1- To encourage Knowledge Acquisition and Foster Innovation & Research.
- M2- To Prepare Students for Immediate Employment, leading to Technological and Socio- economical growth.
- M3- To Provide Guidance for a Productive Career under various programmes.



CITY
ENGINEERING COLLEGE

PROGRAM OUTCOMES (PO)

PO1 – Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 – Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 – Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 – Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 – Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 – The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 – Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 – Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 – Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 – Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 – Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 – Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcome

Computer Science & Engineering: Graduates are able to Analyze, Design and Construct Civil Engineering systems with state-of-the art Technologies.



CITY
ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING /ISE

CONTENTS

1.	COLLEGE CALENDER OF EVENTS
2.	DEPARTMENT CALENDER OF EVENTS
3.	CLASS TIME TABLE AND INDIVISUAL TIME TABLE
4.	UNIVERSITY SYLLABUS
5.	LESSON PLAN
6.	STUDENT-LIST
7.	RECORD OF CLASS WORK (SECTION WISE)
8.	UNIVERSITY QUESTION PAPERS
9.	MODULE WISE QUESTION BANK
	ASSIGNMENT QUESTIONS
11.	NEW TEACHING LEARNING INITIATIVES
12.	REMIDIAL/TUTORIAL CLASSES CONDUCTED, IF APPLICABLE
13.	CONTINUOUS INTERNAL EVALUATION(CIE):
13.1	ATTENDANCE SHORTAGE LIST
13.2	CIE QUESTION PAPER AND SCHEME
13.3	TOPPERS LIST AND BELOW AVERAGE STUDENT LIST
13.4	COUNSELING FORM
14.	RESULT ANALYSIS AND FEEDBACK
14.1	FINAL CIE MARKS LIST (UNIVERSITY COPY)
14.2	SUBJECT RESULT AND STUDENT FEEDBACK



CITY ENGINEERING COLLEGE
ACADEMIC CALENDAR 2022-23 (Odd SEM)

DAY	SEPTEMBER 2022		OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEB 2023	
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
WED	1		2		1		1		1		1	
THU	2		3		2		2		2		2	3 rd sem -III CIE
FRI	3		4		3		3		3		3	
SAT	4		5		4		4		4		4	
SUN	5		6		5		5	1st year Orientation	5		5	
MON	6		7		6		6		6		6	
TUE	7		8	Ayudha pooja	7		7		7	3 rd -II CIE	7	
WED	8		9	Vijaya dashami	8		8		8	7 th sem vtu practical exam starts	8	
THU	9		10		9		9		9		9	
FRI	10		11	Kanakadasa Jayanthi	10		10		10		10	
SAT	11	2 nd Saturday holiday	12	2 nd Saturday holiday	11		11	2 nd Saturday holiday	11		11	3 rd Sem LWD
SUN	12		13		12		12		12		12	2 nd Saturday holi
MON	13		14	START OF 5 th SEM / START OF I SEM	13		13	5 th I CIE	13		13	5 th sem theory e
TUE	14		15		14		14		14		14	3 rd sem practic exam
WED	15		16		15		15		15		15	
THU	16		17		16		16		16		16	
FRI	17		18		17		17		17		17	
SAT	18		19		18		18		18	2 nd Saturday holiday	18	
SUN	19		20		19		19		19	Makara Sankranti	19	
MON	20	START OF 7 th SEMESTER	21		20		20		20	7 th sem vtu theory 5 th sem III CIE	20	
TUE	21		22	7 th sem-I CIE	21		21	7 th sem-II CIE	21		21	
WED	22		23		22		22		22	5 th sem III CIE	22	
THU	23		24		23		23		23	5 th sem III CIE	23	
FRI	24		25		24		24		24		24	
SAT	25	4 th Saturday holiday	26	4 th Saturday holiday	25		25		25		25	4 th Saturday holid
SUN	26		27		26		26	4 th Saturday holiday	26		26	
MON	27		28	Naraka chaturdashi	27		27	Christmas	27		27	
TUE	28		29		28		28		28		28	
WED	29		30	Balipadyami	29		29		29		29	
THU	30				30		30		30	Republic Day	30	
FRI										5 th sem LWD		
SAT										4 th Saturday holiday		
SUN												
MON				START OF 3 rd SEMESTER								
TUE	1/11	Rajyotsava										


 HOD, City Engineering College
 360051
 Mysuru Road

COMPUTER NETWORKS AND SECURITY
(Effective from the academic year 2018 -2019)
SEMESTER – V

Course Code	18CS52	CIE Marks	40
Number of Contact Hours/Week	3:2:0	SEE Marks	60
Total Number of Contact Hours	50	Exam Hours	03

CREDITS –4

Course Learning Objectives: This course (18CS52) will enable students to:

- Demonstration of application layer protocols
- Discuss transport layer services and understand UDP and TCP protocols
- Explain routers, IP and Routing Algorithms in network layer
- Disseminate the Wireless and Mobile Networks covering IEEE 802.11 Standard
- Illustrate concepts of Multimedia Networking, Security and Network Management

Module 1

Contact Hours

10

Application Layer: Principles of Network Applications: Network Application Architectures, Processes Communicating, Transport Services Available to Applications, Transport Services Provided by the Internet, Application-Layer Protocols, The Web and HTTP: Overview of HTTP, Non-persistent and Persistent Connections, HTTP Message Format, User-Server Interaction: Cookies, Web Caching, The Conditional GET, File Transfer: FTP Commands & Replies, Electronic Mail in the Internet: SMTP, Comparison with HTTP, (Mail Message Format, Mail Access Protocols, DNS: The Internet's Directory Service: Services Provided by DNS,) Overview of How DNS Works, DNS Records and Messages, (Peer-to-Peer Applications: P2P File Distribution, Distributed Hash Tables, Socket Programming: creating Network Applications (Socket Programming with UDP, Socket Programming with TCP.))

T1: Chap 2

RBT: L1, L2, L3

Module 2

10

Transport Layer : Introduction and Transport-Layer Services: Relationship Between Transport and Network Layers, Overview of the Transport Layer in the Internet, Multiplexing and Demultiplexing: Connectionless Transport: UDP, UDP Segment Structure, UDP Checksum, Principles of Reliable Data Transfer: Building a Reliable Data Transfer Protocol, Pipelined Reliable Data Transfer Protocols, Go-Back-N, Selective repeat, Connection-Oriented Transport TCP: The TCP Connection, TCP Segment Structure, Round-Trip Time Estimation and Timeout, Reliable Data Transfer, Flow Control, TCP Connection Management, Principles of Congestion Control: The Causes and the Costs of Congestion, Approaches to Congestion Control, Network-assisted congestion-control example, ATM ABR Congestion control, TCP Congestion Control: Fairness.

T1: Chap 3

RBT: L1, L2, L3

Module 3

10

The Network layer: What's Inside a Router?: Input Processing, Switching, Output Processing, Where Does Queuing Occur? Routing control plane, IPv6, A Brief foray into IP Security, Routing Algorithms: The Link-State (LS) Routing Algorithm, The Distance-Vector (DV) Routing Algorithm, Hierarchical Routing, Routing in the Internet, Intra-AS Routing in the Internet: RIP, Intra-AS Routing in the Internet: OSPF, Inter/AS Routing: BGP, Broadcast Routing Algorithms and Multicast.

T1: Chap 4: 4.3-4.7

RBT: L1, L2, L3

<p>Module 4</p> <p>Network Security: Overview of Network Security: Elements of Network Security , Classification of Network Attacks .Security Methods .Symmetric-Key Cryptography :Data Encryption Standard (DES).Advanced Encryption Standard (AES) . Public-Key Cryptography :RSA Algorithm .Diffie-Hellman Key-Exchange Protocol . Authentication :Hash Function . Secure Hash Algorithm (SHA) . Digital Signatures . Firewalls and Packet Filtering .Packet Filtering . Proxy Server .</p> <p>Textbook2: Chapter 10 RBT: L1, L2, L3</p>	10
<p>Module 5</p> <p>Multimedia Networking: Properties of video. properties of Audio. Types of multimedia Network Applications. Streaming stored video: UDP Streaming. HTTP Streaming. Adaptive streaming and DASH. content distribution Networks</p> <p>Voice-over-IP :Limitations of the Best-Effort IP Service .Removing Jitter at the Receiver for Audio .Recovering from Packet Loss Protocols for Real-Time Conversational Applications , RTP , SIP</p> <p>Textbook11: Chap 7 RBT: L1, L2, L3</p>	10
<p>Course Outcomes: The student will be able to :</p> <ul style="list-style-type: none"> • Explain principles of application layer protocols • Recognize transport layer services and infer UDP and TCP protocols • Classify routers. IP and Routing Algorithms in network layer • Understand the Wireless and Mobile Networks covering IEEE 802.11 Standard • Describe Multimedia Networking and Network Management 	
<p>Question Paper Pattern:</p> <ul style="list-style-type: none"> • The question paper will have ten questions. • Each full Question consisting of 20 marks • There will be 2 full questions (with a maximum of four sub questions) from each module. • Each full question will have sub questions covering all the topics under a module. • The students will have to answer 5 full questions, selecting one full question from each module. 	
<p>Textbooks:</p> <ol style="list-style-type: none"> 1. James F Kurose and Keith W Ross, Computer Networking, A Top-Down Approach, Sixth edition, Pearson, 2017 . 2. Nader F Mir, Computer and Communication Networks, 2nd Edition, Pearson, 2014. 	
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. Behrouz A Forouzan, Data and Communications and Networking, Fifth Edition, McGraw Hill, Indian Edition 2. Larry L Peterson and Bruce S Davie, Computer Networks, fifth edition, ELSEVIER 3. Andrew S Tanenbaum, Computer Networks, fifth edition, Pearson 4. Mayank Dave, Computer Networks, Second edition, Cengage Learning 	



DEPARTMENT OF CSE / ISE

LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2021 - 2022

Course Title: COMPUTER NETWORKS AND SECURITY	Course Code : 18CS52
Total contact hours: L:T:P:S : 3:2 :0	End Term Marks :60
Internal Marks : 40	
Semester :5	Academic year : 2022-2023
Lesson plan Author: Sangeetha Rao S / <i>Doreswamy</i>	Date :07-10-2022

Course Objectives:

This course will enable students to

1. Demonstration of application layer protocols
2. Discuss transport layer services and understand UDP and TCP protocols
3. Explain routers, IP and Routing Algorithms in network layer
4. Disseminate the Wireless and Mobile Networks covering IEEE 802.11 Standard
5. Illustrate concepts of Multimedia Networking, Security and Network Management

Course Outcomes:

The students shall able to:

1. Explain principles of application layer protocols
2. Recognize transport layer services and infer UDP and TCP protocols
3. Classify routers, IP and Routing Algorithms in network layer
4. Understand the Wireless and Mobile Networks covering IEEE 802.11 Standard
5. Describe Multimedia Networking and Network Management

Module 1

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	Module1 Principles of Network Applications: Network Application Architectures	L1,L2	CO1,CO2
	Processes Communicating, Transport Services	L1,L2	CO1
	Available to Applications, Services Provided by the Internet,	L1,L2	CO1
	Application Layer Protocols	L1,L2	CO1
2	The Web and HTTP: Overview of HTTP,	L1,L2	CO1
	Non-persistent and Persistent Connections, HTTP Message Format,	L1,L2	CO1
	User-Server Interaction: Cookies, Web Caching, The Conditional	L1,L2	CO1
	The Conditional GET, File Transfer: FTP	L1,L2	CO1

	Commands & Replies, Electronic Mail in the Internet		
3	SMTP, Comparison with HTTP, Mail Message Format,	L1,L2	CO1
	Mail Access Protocols, DNS; The Internet Directory Service, Services Provided by DNS,	L1,L2	CO1
	Overview of How DNS Works, DNS Records and Messages,	L1,L2	CO1
4	Peer-to-Peer Applications: P2P File Distribution, , Distributed Hash Tables	L1,L2	CO1

Module 2

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
4	Socket Programming: creating Network Applications:	L1,L2	CO1,CO2
	Socket Programming with UDP, Programming with TCP	L1,L2	CO1,CO2
5	Module 2	L1,L2	CO1,CO2,CO3
	Introduction and Transport-Layer Services: Relationship Between Transport and Network Layers,		
	Overview of the Transport Layer in the Internet	L1,L2	CO2
	Multiplexing and Demultiplexing: Connectionless Transport: UDP, UDP Segment Structure, UDP Checksum	L1,L2	CO2
6	Principles of Reliable Data Transfer: Building a Reliable Data Transfer Protocol	L1,L2	CO1,CO2
	Pipelined Reliable Data Transfer Protocols, Go-Back-N, Selective repeat	L1,L2	CO1,CO2
	Connection-Oriented Transport TCP: The TCP Connection	L1,L2	CO1,CO2
	TCP Segment Structure, Round-Trip Time Estimation and Timeout,	L1,L2	CO1,CO2

Module 3

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
7	Reliable Data Transfer, Flow Control,	L1,L2	CO1,CO2
	TCP Connection Management	L1,L2	CO1,CO2
	Principles of Congestion Control:		
	The Causes and the Costs of Congestion		
8	Approaches to Congestion Control	L1,L2	CO1,CO2,CO3
	Network-assisted congestion-control	L1,L2	CO1,CO2,CO3
	ATM ABR Congestion control	L1,L2	CO1,CO2,CO3
	TCP Congestion Control: Fairness.	L1,L2	CO1,CO2
9	Module 3	L1,L2	CO1,CO2,CO3
	The Network layer: What's Inside a Router?:		
	Input Processing, Switching, Output Processing, Where Does Queuing Occur?	L1,L2	CO1,CO2,CO3

Module 4

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
9	Routing control plane,	L1,L2	CO3
	IPv6,A Brief foray into IP Security	L1,L2	CO3
	Routing Algorithms	L1,L2	CO3
10	The Link-State (LS) Routing Algorithm	L1,L2	CO3
	The Distance-Vector(DV) Routing Algorithm, Hierarchical Routing	L1,L2	CO3
	Routing in the Internet, Intra-AS Routing in the Internet: RIP,	L1,L2	CO3
	Intra-AS Routing in the Internet: OSPF,	L1,L2	CO3
	Inter/AS Routing: BGP, Broadcast Routing Algorithms and Multicast.	L1,L2	CO3
11	Network Security: Overview of Network Security: Elements of Network Security	L1,L2	CO3
	Classification of Network Attacks ,Security Methods	L1,L2	CO3,CO4
	Symmetric-Key Cryptography, Data Encryption Standard (DES), Advanced Encryption Standard (AES)	L1,L2	CO4

Module 5

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
12	Public-Key Cryptography :RSA Algorithm	L1,L2,L3	CO3,CO4
	Diffie-Hellman Key-Exchange Protocol	L1,L2,L3	CO3,CO4
	Authentication: Hash Function , Secure Hash Algorithm (SHA)		CO3,CO4
13	Digital Signatures	L1,L2,L3	CO4
	Firewalls and Packet Filtering ,	L1,L2	CO2, CO3
	Packet Filtering	L1,L2	CO2
	Proxy Server	L1,L2	CO2,CO3
12	Multimedia Networking: Properties of video	L1,L2	CO3,CO5
	Properties of Audio, Types of multimedia	L1,L2	CO4,CO5
13	Network Applications,	L1,L2	CO4,CO5
	Streaming stored video: UDP Streaming,	L1,L2	CO4,CO5
	HTTP Streaming, Adaptive	L1,L2	CO4,CO5
	Streaming and DASH, content distribution Networks	L1,L2	CO4,CO5
14	Voice-over-IP :Limitations of the Best-Effort IP Service	L1,L2	CO4,CO5
	Removing Jitter at the Receiver for Audio	L1,L2	CO4,CO5
	Recovering from Packet Loss Protocols for Real-Time Conversational Applications	L1,L2	CO4,CO5
	RTP , SIP		CO4,CO5

RBT Level

L1-Remembering L2-Understanding L3-Applying L4-Analysing L5-Evaluating L6-Creating

Text Book:

1. James F Kurose and Keith W Ross, Computer Networking, A Top-Down Approach, Sixth edition, Pearson, 2017 .
2. Nader F Mir, Computer and Communication Networks, 2nd Edition, Pearson, 2014.

Reference Books:

1. Behrouz A Forouzan, Data and Communications and Networking, Fifth Edition, McGraw Hill, Indian Edition
2. Larry L Peterson and Bruce S Davie, Computer Networks, fifth edition, ELSEVIER
3. Andrew S Tanenbaum, Computer Networks, fifth edition, Pearson
4. Mayank Dave, Computer Networks, Second edition, Cengage Learning



Signature of Faculty



Signature of HOD



Computer Networks and Security(18CS52)
MODULE WISE QUESTION BANK
MODULE 1

1. Explain Network Application Architectures.
2. Explain transport services available to applications
3. Give overview of Web and HTTP.
4. Explain Non-Persistent and persistent TCP connections.
5. Write the HTTP request and HTTP response message format
6. Explain Web Caching (Proxy Server).
7. Write and Explain FTP Commands and Replies.
8. Compare HTTP with SMTP
9. Explain mail access protocol – POP3
10. Explain the services provided by DNS
11. Explain the 3 classes of DNS servers organized in hierarchy.
12. Explain DNS resource record.
13. Explain scalability of P2P architecture or Illustrate simple quantitative model for file distribution to a fixed set of peers
14. Explain circular DHT
15. Explain socket programming with TCP.

MODULE 2

1. Explain the relationship between Transport and Network layer
2. Explain transport layer Multiplexing and De-multiplexing.
3. Why an application developer would ever choose to build an application over UDP rather than TCP?
4. Explain reliable data transfer over a channel with bit errors using FSM.
5. Explain reliable data transfer over Lossy channel with bit errors using FSM.
6. Explain pipelined Go Back N Protocol with FSM.
7. Explain TCP segment structure.
8. Explain round trip time estimation and time out.

9. Explain flow control.
10. Explain TCP Congestion management.
11. Write FSM description of TCP congestion control.

MODULE 3

1. What is Forwarding and Routing?
2. Explain What's Inside a Router?
3. Explain Input Processing, Switching and Output Processing.
4. Explain where does queuing occur?
5. What is routing control plane?
6. Explain IPV6 Datagram format.
7. Explain the transition from IPV4 to IPV6 or Tunnelling.
8. Give a brief introduction about IP Security?
9. What are routing algorithms and explain the types of routing algorithm.
10. Explain the Link State Routing Algorithm.
11. Explain the Distance Vector Routing Algorithm.
12. Write a comparison between LS and DV Routing Algorithm.
13. Explain Hierarchical routing with Autonomous system.
14. Explain Intra AS Routing algorithm: RIP.
15. Explain Intra AS Routing algorithm: OSPF.
16. Explain Inter AS Routing algorithm: BGP.
17. Explain Broadcast Routing Algorithm with all the types.
18. Explain IGMP.
19. Explain Multicast Routing Algorithm.

MODULE 4

1. Explain GSM 2G cellular network architecture.
2. Explain 3G Cellular Data Networks with 3G core network.
3. Explain 3G Radio Access Network or the wireless edge.
4. Explain LTE on to 4G
5. Explain routing to a mobile node with its types, consider 2G architecture.

6. Explain Mobile IP with three main phases.
7. Explain Handoff in GSM.
8. Explain managing mobility in cellular networks.

MODULE 5

1. Write the properties of Video.
2. Explain Streaming stored audio and video.
3. Explain HTTP Streaming.
4. Explain Netflix with Architecture.
5. Explain Diffserv
6. Explain Adaptive streaming and DASH
7. Explain CDN Operation.
8. Explain the three broad approaches towards network level support for multimedia Applications.

ASSIGNMENT QUESTIONS -1

COMPUTER NETWORKS AND SECURITY (18CS52)

1. Consider an e-commerce site that wants to keep a purchase record for each of its customers. Describe how this can be done with cookies.
2. Describe in detail the services provided by DNS and Explain the DNS message format.
3. Suppose Alice, with a Web based E-mail account (such as hotmail or Gmail), and sends a message to Bob, who accesses his mail from his mail server using POP3. Discuss how the message gets from Alice's host to Bob's Host. (Be sure to list the series of application layers protocols that are used to move the message between the two hosts.)
4. What are the advantages and disadvantages of mesh and circular DTH?
5. Explain in detail the General format of an HTTP request message.
6. Explain client-server and Peer-to-Peer architecture
7. Explain the working of BitTorrent for file distribution.
8. Describe in detail the services offered by DNS and explain DNS message format.
9. Compare HTTP and SMTP
10. With a diagram explain the interaction of the various DNS servers.
11. What are the different services available in to applications? Explain
12. Explain HTTP request and response message format?
13. Write a note on FTP and discuss about FTP command and replies.
14. what are the steps involved between client and server in order to fetch 10 Jpeg images which are residing in the same server by using non- persistent HTTP connection. The URL for the base HTML file is <http://www.xyz.edu/department/base.index>
15. Illustrate how user1 can send mail to user 2 and how user 2 receives mail by using SMTP.

ASSIGNMENT 2

Computer Networks and Security (18CS52)

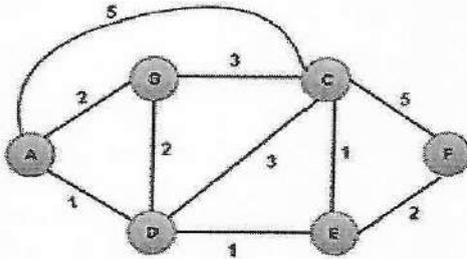
- 1) Write a note on 1) UDP Socket 2) TCP Socket
- 2) Design a client server application with following functionality using UDP Socket
 - The server receives the data and converts the characters to uppercase.
 - The server sends the modified data to the client.
 - The client receives the modified data and displays the line on its screen.
- 3) Design a client server application with following functionality using TCP Socket
 - The client reads a line of characters (data) from its keyboard and sends the data to the server.
 - The server receives the data and converts the characters to uppercase.
 - The server sends the modified data to the client.
 - The client receives the modified data and displays the line on its screen.
- 4) Illustrate the relationship between transport layer and network layer
- 5) Explain the various transport layer functionalities.
- 6) Write a note on Transport layer in Internet
- 7) Write a note on a) Multiplexing and Demultiplexing b) Port number
- 8) Even though UDP is unreliable protocol, why UDP is suitable for many applications?
- 9) Explain the UDP segment Structure
- 10) Calculate UDP Checksum at both sender and receiver side for the following data
 - 0110011001100000
 - 0101010101010101
 - 1000111100001100
- 11) Illustrate simplest protocol for a completely reliable channel

- 12) Illustrate how duplicate packets are handled by Transport layer reliable data transfer protocol with proper FSM diagrams
- 13) Write FSM for a reliable data transfer protocol which handles duplicate ACK
- 14) Write a note on stop and wait ARQ
- 15) Illustrate how Reliable Data Transfer is supported by transport layer over a Lossy Channel with Bit Errors.
- 16) Why Pipelined protocols are better than compared to Stop and wait ARQ
- 17) Explain Go back N ARQ
- 18) With Proper diagrams Illustrate how selective repeat ARQ overcomes the limitations of Go- Back-N ARQ
- 19) Explain TCP segment Structure
- 20) Write a note on TCP sequence and Acknowledgement number.
- 21) Show how round-trip time is estimated to decide timeout period.
- 22) Explain how TCP achieves reliable data transmission.
- 23) Write a note on TCP flow control
- 24) Explain the various phases of TCP connection management with statediagram.
- 25) Explain the various Congestion scenarios
- 26) Explain the Various approaches available to control congestion. (End to end, Network Assisted)
- 27) Explain how TCP controls the congestion (Slow start, congestion avoidance, fast retransmit)
- 28) Write a note on ATM – ABR congestion control.

ASSIGNMENT QUESTIONS-3

Computer Networks & Security (18CS52)

1. Explain Distance Vector Algorithm with an example
2. Write link State algorithm and apply it for the following graph with source node A



3. Explain three switching techniques in router
4. Explain IPV6 datagram format
5. Explain the intra AS routing protocol: RIP in detail
6. Discuss about uncontrolled flooding and controlled flooding in broadcast routing algorithm
7. Compare and contrast IPv4 and IPv6 header fields. Do they have any fields in common? Explain.
8. What are the roles played by the IGMP protocol and wide area Multicast routing protocol?
9. Explain 4 types of hierarchical OSPF routers
10. Explain in detail about IGMP protocol
11. Illustrate how a computer receives IP address using DHCP protocol.
12. Illustrate how Network address translation occurs in IPv4 networks

USN

1	C	E							
---	---	---	--	--	--	--	--	--	--

CITY ENGINEERING COLLEGE
FIRST INTERNAL TEST

Branch: CSE
Subject Name: Computer Network and Security
Semester: V SEM
Section: A & B

Date: 14/11/2022
Sub Code: 18CS52

Time: 2:30 PM to 4:00PM

Max Marks: 50

Note: Answer any FIVE questions choosing at least ONE from each.

Q.no	Part A	Marks	CO	BT
1.	Consider an e-commerce site that wants to keep a purchase record for each of its customers. Describe how this can be done with cookies.	10	CO 1	BT 1, BT 2
OR				
2.	Suppose Alice, with a Web based E-mail account (such as hotmail or Gmail), and sends a message to Bob, who accesses his mail from his mail server using POP3. Discuss how the message gets from Alice's host to Bob's Host. (Be sure to list the series of application layers protocols that are used to move the message between the two hosts.)	10	CO1 CO2	BT 1, BT 2
Part B				
3.	Explain HTTP request and response message format?	10	CO1 CO2	BT 1, BT 2
OR				
4.	Write a note on FTP and discuss about FTP command and replies.	10	CO1 CO2	BT 1, BT 2
Part C				
5 a.	Compare HTTP and SMTP? Define Caching?	5	CO1 CO2	BT 1, BT 2
5 b.	Illustrate how user1 can send mail to user 2 and how user.2 receives mail by using SMTP	5		
OR				
6.	What are the steps involved between client and server in order to fetch 10 Jpeg images which are residing in the same server by using non- persistent HTTP connection. The URL for the base HTML file is http://www.xyz.edu/department/base.index	10	CO1 CO2	BT 1, BT 2 BT 3
Part D				
7.	Explain client-server and Peer-to-Peer architecture	10	CO1 CO2	BT 1, BT 2
OR				
8.	Explain the working of BitTorrent for file distribution.	10	CO 1 CO 2	BT 1, BT 2
Part E				
9.	With a diagram explain the interaction of the various DNS servers.	10	CO1 CO2	BT 1, BT 2
OR				

CITY ENGINEERING COLLEGE

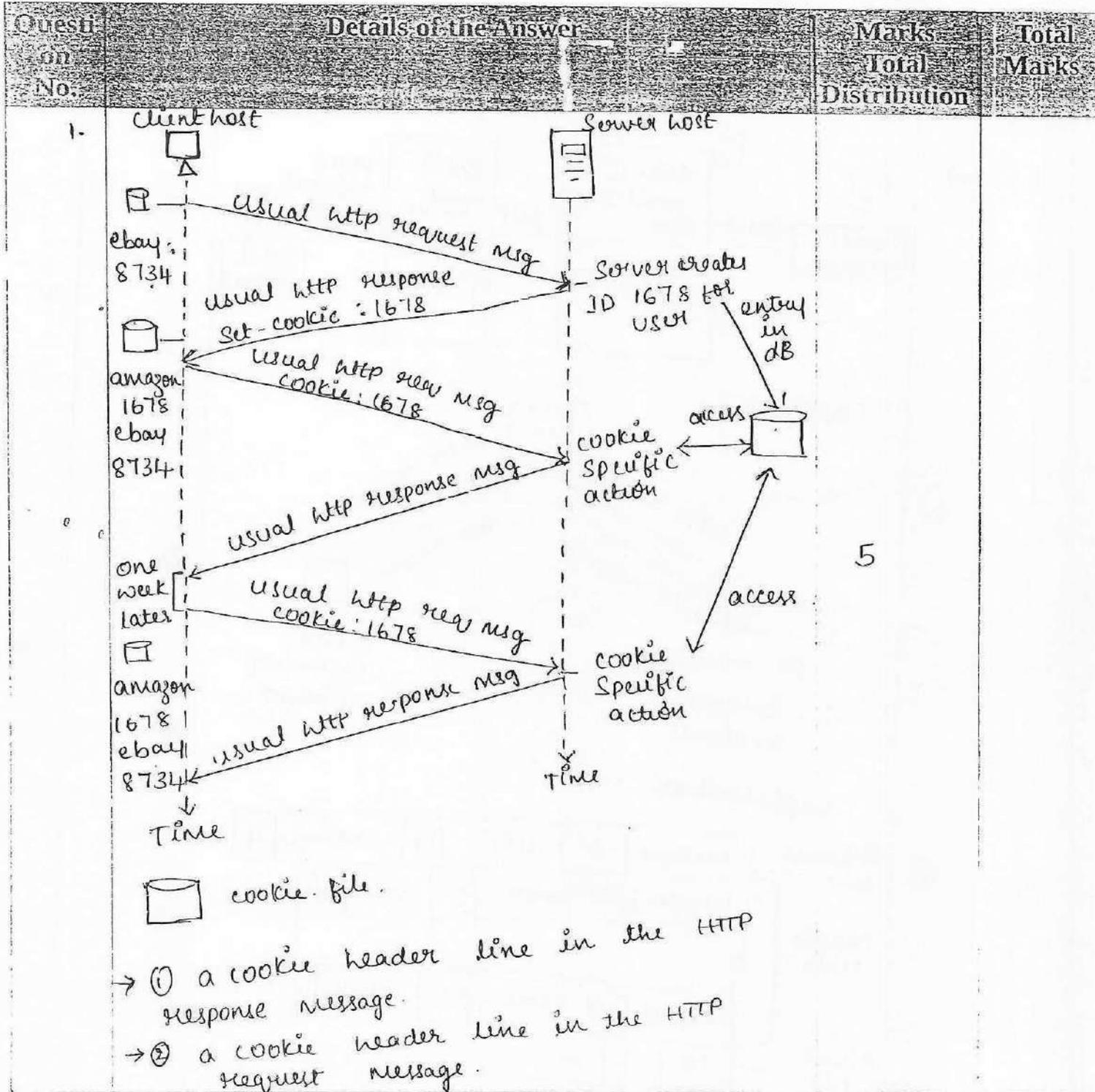
DEPARTMENT OF CSE/TSE

SCHEME FOR VALUATION

Internal Test I

V Semester & Section: A & B

Date: 14/11/20



Staff

Handwritten signature

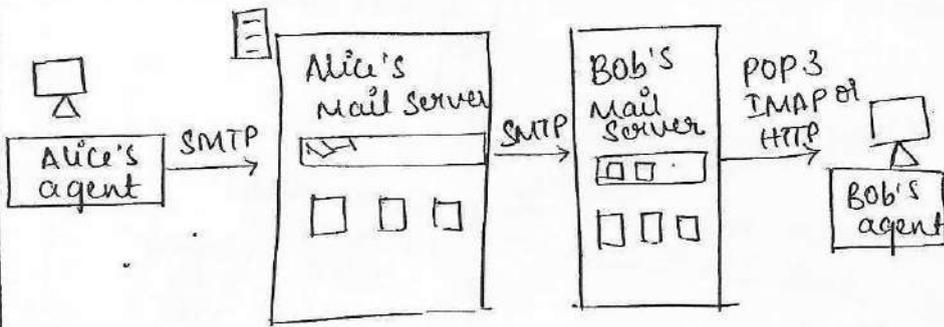
Question No.	Details of the Answer	Marks Total Distribution	Total Marks
--------------	-----------------------	--------------------------	-------------

- ③ a cookie file kept on user's end system and managed by user's browser.
- ④ a backend dB at the website.

5

10

2)



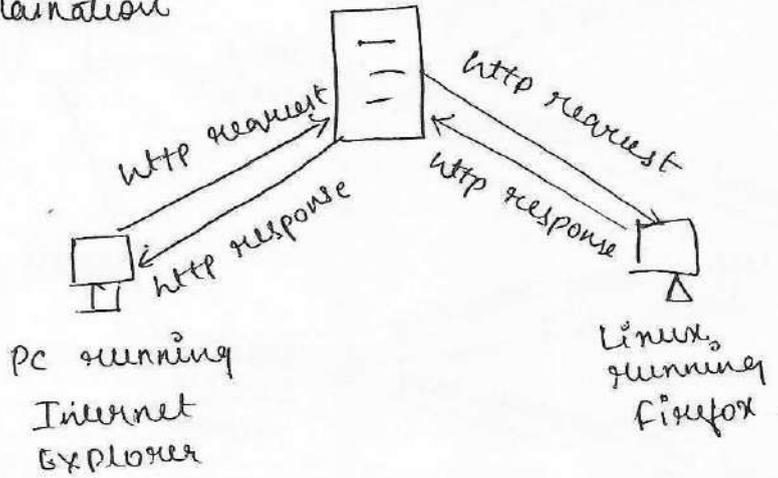
5

10

5

3)

Explanation



2

10

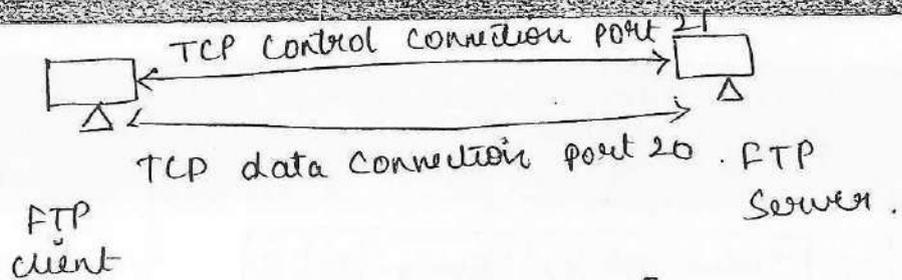
2

Explanation

Request line	Method	SP	URL	SP	version	cr	lf
header lines	header field name		SP	value		cr	lf
	header field name:		SP	value		cr	lf
Blank line	cr		lf				
Entity body							

3

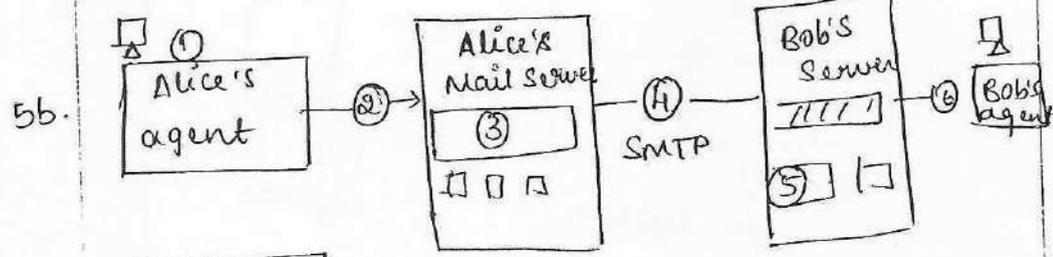
Question No.	Details of the Answer	Marks Total	Total Marks
--------------	-----------------------	-------------	-------------



5a. Pull protocol
 HTTP
 SMTP Push protocol
 Diagram with Explanation

- HTTP does not mandatu data to be 7bit ASCII format
- Encapsulates each object in its own HTTP response msg.
- It use web server to extract the requested object
- use port no 80

- SMTP requires each message to be 7bit ASCII format
- Internet mail places all message objects into one message
- It uses the mail server
- It use port no 25



5b. message queue.
 [2] User mailbox.
 Diagram with Explanation

[Handwritten signature]

CITY ENGINEERING COLLEGE

DEPARTMENT OF CSE

SCHEME FOR VALUATION

Internal Test I

V Semester & Section: A & B

Date: 12/11/22

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
6.	<p>Let's suppose the page consists of a base HTML file with 10 JPEG images URL for the base HTML file is $Http://www.xyz.edu/department/base.index$</p> <p>→ HTTP client process initiates a TCP connection to the server $www.xyz.edu$ on port no 80. default port no of web.</p> <p>→ HTTP client sends HTTP req msg to the server via socket. This req msg includes Pathname / Some Department / base.index.</p> <p>→ HTTP Server process receive the req msg via its socket retrieves the object / some department / base.index from its storage encapsulates the object in HTTP response msg. Sends to the client via socket.</p> <p>→ HTTP Server tells TCP to close the TCP connection</p> <p>→ HTTP client receives response msg. TCP connection is terminated. The msg indicates encapsulated object in an HTML file. The client extracts the file from</p>		

CITY ENGINEERING COLLEGE
DEPARTMENT OF ISE

SCHEME FOR VALUATION

Internal Test 7

V Semester & Section: A & B

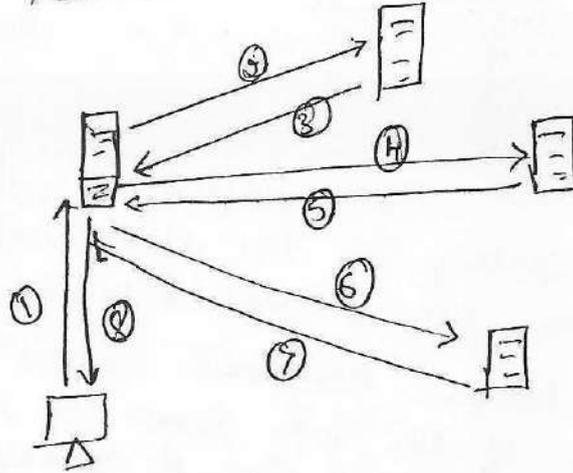
Date: 12/11/22

Question No.	Details of the Answer	Marks Distribution	Total Marks
8.	<p>In BitTorrent, the collection of all peers participating in the distribution of a particular file is called a torrent. Peers in a torrent download equal size chunks of the file from one another with chunk size of 256Kbytes.</p> <div style="text-align: center;"> <p style="text-align: center;">Tracker Peer. Obtain list of Peers Trading chunks File Distribution with BitTorrent.</p> </div>	10	10
9.	<p>Two types of Interaction</p> <p>① Recursive Queries</p> <p>Here DNS query is sent to local DNS server then to root server then to TLD server and finally to authoritative DNS server.</p>		

[Handwritten Signature]

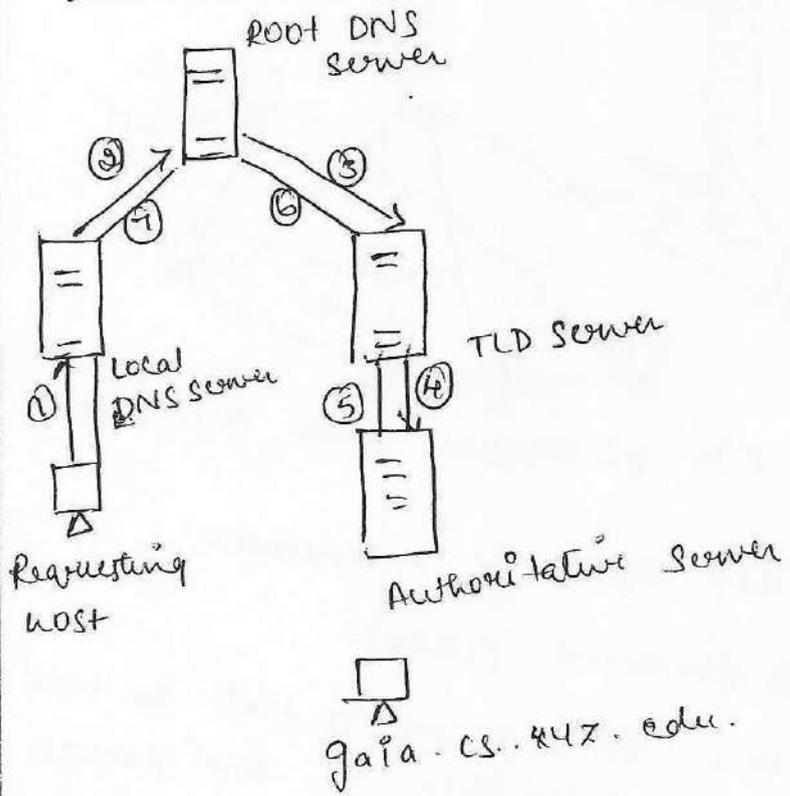
Question No.	Details of the Answer	Marks Distribution	Total Marks
--------------	-----------------------	--------------------	-------------

DNS response arrives in the reverse order.



5

⑥ Iterative Queries



5

10

CITY ENGINEERING COLLEGE

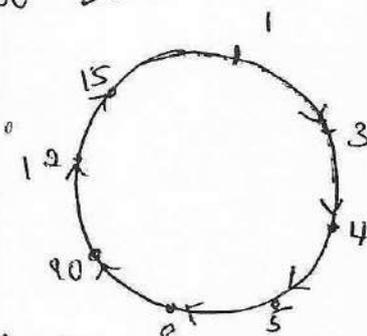
DEPARTMENT OF ISE

SCHEME FOR VALUATION

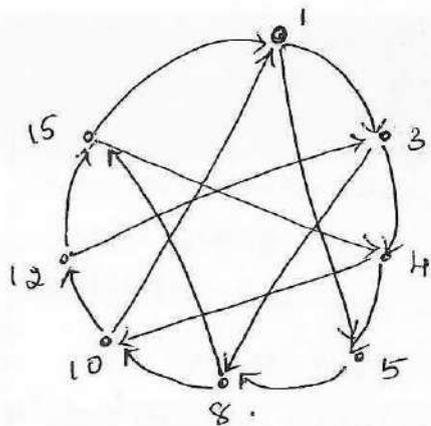
Internal Test I

V Semester & Section: A & B

Date: 12/11/21

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
10.	<p>Centralized version of simple database will contain (Key, value) pairs. we query the DB with a key if there are one or more key-value pairs in DB that match the query key. the DB returns corresponding values.</p> <p>circular DHT</p>  <p>Organizing the peers into a circular arrangement, each peer keeps track of its immediate successor and immediate predecessor (modulo 2^n)</p> <p>Detailed Explanation</p> <p>Shortcuts are used to expedite the routing of query messages. when peer receives query</p>	5	

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
--------------	-----------------------	--------------------------	-------------



An example of circular DTH with shortcuts

5

10

[Handwritten signature]

CITY ENGINEERING COLLEGE
SECOND INTERNAL TEST

Branch: CSE
Subject Name: Computer Network and Security
Semester: V SEM
Section: A & B

Date: 12/12/2022
Sub Code: 18CS52

Time: 2:30 PM to 4:00PM

Max Marks: 50

Note: Answer any FIVE questions choosing at least ONE from each.

Q.no	Part A	Marks	CO	BT
1.	Design a client server application with following functionality using UDP socket a) The client reads a line of characters (data) from its keyboard and sends the data to the server. b) The server receives the data and converts the characters to uppercase. c) The server sends the modified data to the client. d) The client receives the modified data and displays the line on its screen.	10	CO 1	BT 1, BT 2
OR				
2.	Even though UDP is unreliable protocol, why UDP is suitable for many applications?	10	CO1 CO2	BT 1, BT 2
Part B				
3.	With Proper diagrams Illustrate how selective repeat ARQ overcomes the limitations of Go- Back-N ARQ	10	CO1 CO2	BT 1, BT 2
OR				
4	Write FSM for a reliable data transfer protocol which handles duplicate ACK	10	CO1 CO2	BT 1, BT 2
Part C				
5a.	Why Pipelined protocols are better than compared to Stop and wait ARQ.	5	CO1 CO2	BT 1, BT 2
5 b.	Explain how TCP achieves reliable data transmission.	5		
OR				
6.	Explain Go back N ARQ	10	CO1 CO2	BT 1, BT 2
Part D				
7.	Explain TCP segment Structure	10	CO1 CO2	BT 1, BT 2
OR				
8.	Explain the various phases of TCP connection management with state diagram.	10	CO 1 CO 2	BT 1, BT 2
Part E				
9.	Explain how TCP controls the congestion (Slow start, congestion avoidance, fast retransmit)	10	CO1 CO2	BT 1, BT 2
OR				

10 a.	Write a note on a) Multiplexing and Demultiplexing b) Port number	5	CO1	BT1,
10 b.	Illustrate the relationship between transport layer and network layer	5	CO2	BT 2

Blooms Taxonomy Levels (BTL):

BT1- Remembering the concepts **BT2-** Understanding **BT3 –** Applying **BT4 –** Analyzing **BT5-** Evaluating

Course Outcomes (CO's):

CO1: Demonstration of application layer protocols

CO2: Discuss transport layer services and understand UDP and TCP protocols

CITY ENGINEERING COLLEGE
 DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING / ISE
 SCHEME FOR EVALUATION

CIE TEST 2

SEMESTER & SECTION: V, A & B

DATE: 10/12/22

Q. No	Details of the Answer	Marks Distribution	Total
1.	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="text-align: center;"><u>Server</u> (Running on Server IP)</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> create socket, port = x; ServerSocket = socket(AF_INET, SOCK_DGRAM) </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Read UDP Segment from ServerSocket </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px;"> Write reply to ServerSocket specifying client address Port number </div> </div> <div style="width: 45%;"> <p style="text-align: center;"><u>Client</u></p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Create socket: clientSocket = socket(AF_INET, SOCK_DGRAM) </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Create datagram with Server IP and port = x, Send datagram via clientSocket </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Read datagram from clientSocket </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px;"> Close clientSocket </div> </div> </div> <p><u>UDP client PY</u></p> <pre> from socket import * ServerName = 'hostname' ServerPort = 12000 clientSocket = socket(socket.AF_INET, socket.SOCK_DGRAM) message = raw_input('Input lowercase sentence:') clientSocket.sendto(message, (ServerName, ServerPort)) </pre>	2	
		4	

[Handwritten Signature]

Q. No	Details of the Answer	Marks Distribution	Total marks
	<pre> modified message, serverAddress = clientSocket.recvfrom(2048) print modifiedMessage clientSocket.close() UDPServer.py from socket import * serverPort = 12000 serverSocket = socket(AF_INET, SOCK_DGRAM) serverSocket.bind(('', serverPort)) print "The server is ready to receive" while 1: message, clientAddress = serverSocket.recvfrom(2048) modifiedMessage = message.upper() serverSocket.sendto(modifiedMessage, clientAddress) </pre> <p>2) finer application level control over what data is sent and when</p> <ul style="list-style-type: none"> • no connection establishment • no connection state • small packet no header overhead. 	4	10
3.			

CITY ENGINEERING COLLEGE
 DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING /ISE
 SCHEME FOR EVALUATION
 CIE TEST 2

SEMESTER & SECTION: V, A & B

DATE: 10/12/22

Q. No	Details of the Answer	Marks Distribution	Total mark
	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Sender</p> <p>Pkt 0 sent 0 1 2 3 4 5 6 7 8 9</p> <p>Pkt 1 sent 0 1 2 3 4 5 6 7 8 9</p> <p>Pkt 2 sent 0 1 2 3 4 5 6 7 8 9</p> <p>Pkt 3 sent, window full 0 1 2 3 4 5 6 7 8 9</p> <p>ACK 0 recvd, Pkt 4 0 1 2 3 4 5 6 7 8 9</p> <p>ACK 1 recvd, Pkt 5 0 1 2 3 4 5 6 7 8 9</p> <p>Pkt 2 TIMEOUT, Pkt 2 Resent 0 1 2 3 4 5 6 7 8 9</p> <p>ACK 3 recvd, nothing sent 0 1 2 3 4 5 6 7 8 9</p> </div> <div style="width: 45%; border-left: 1px dashed black; padding-left: 10px;"> <p>Receiver</p> <p>Pkt 0 recvd, delivered, ACK 0 0 1 2 3 4 5 6 7 8 9</p> <p>Pkt 1 recvd, delivered, ACK 1 0 1 2 3 4 5 6 7 8 9</p> <p>Pkt 3 recvd, buffered, ACK 3 0 1 2 3 4 5 6 7 8 9</p> <p>Pkt 4 recvd, buffered, ACK 4 0 1 2 3 4 5 6 7 8 9</p> <p>Pkt 5 recvd, buffered, ACK 5 0 1 2 3 4 5 6 7 8 9</p> <p>Pkt 2 recvd, Pkt 2, Pkt 3 5 delivered, ACK 2 sent 0 1 2 3 4 5 6 7 8 9</p> </div> </div>		

Selective Repeat Operation.

Q. No	Details of the Answer	Marks Distribution	Total marks
	<p>Sender window</p> <p>Receiver window</p> <p>timeout & retransmit pkt 0</p> <p>receive packet with seq no 0</p> <pre> graph TD subgraph Sender_Window [Sender window] S0[0] S1[1] S2[2] S3[3] S0_2[0] S1_2[1] S2_2[2] end subgraph Receiver_Window [Receiver window] R0[0] R1[1] R2[2] R3[3] R0_2[0] R1_2[1] R2_2[2] end S0 -- "PKT 0" --> R0 S1 -- "PKT 1" --> R1 S2 -- "PKT 2" --> R2 S0_2 -- "PKT 0" --> R0_2 S1_2 -- "PKT 1" --> R1_2 S2_2 -- "PKT 2" --> R2_2 R0 -- "ACK 0" --> S0 R1 -- "ACK 1" --> S1 R2 -- "ACK 2" --> S2 R0_2 -- "ACK 0" --> S0_2 R1_2 -- "ACK 1" --> S1_2 R2_2 -- "ACK 2" --> S2_2 S0_2 -- "X" --> R0_2 S1_2 -- "X" --> R1_2 S2_2 -- "X" --> R2_2 S0_2 -- "timeout & retransmit" --> S0_2 S0_2 -- "PKT 0" --> R0_2 R0_2 -- "receive packet with seq no 0" --> S0_2 </pre> <p>4</p> <pre> graph TD State1((wait for call 0 flow above)) State2((wait for ACK or NAK)) State3((wait for call 1 flow above)) State4((wait for ACK or NAK)) State1 -- "rdt_send(data)" --> State2 State2 -- "rdt_send(sndpkt)" --> State3 State3 -- "rdt_send(data)" --> State4 State4 -- "rdt_send(sndpkt)" --> State1 State2 -- "rdt_rcv(rcvpkt) && (corrupt(rcvpkt) || is NAK(rcvpkt))" --> State2 State3 -- "rdt_rcv(rcvpkt) && not corrupt(rcvpkt) && is ACK(rcvpkt)" --> State1 State4 -- "rdt_rcv(rcvpkt) && not corrupt(rcvpkt) && is ACK(rcvpkt)" --> State3 </pre>	5	10
A	<pre> graph TD State5((wait for ACK or NAK)) State6((wait for call 1 flow above)) State5 -- "rdt_send(data)" --> State6 State6 -- "rdt_send(sndpkt)" --> State5 State5 -- "rdt_rcv(rcvpkt) && (corrupt(rcvpkt) || is NAK(rcvpkt))" --> State5 State6 -- "rdt_rcv(rcvpkt) && not corrupt(rcvpkt) && is ACK(rcvpkt)" --> State5 </pre>	10	10

CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING / ISE

SCHEME FOR EVALUATION

CIE TEST 2

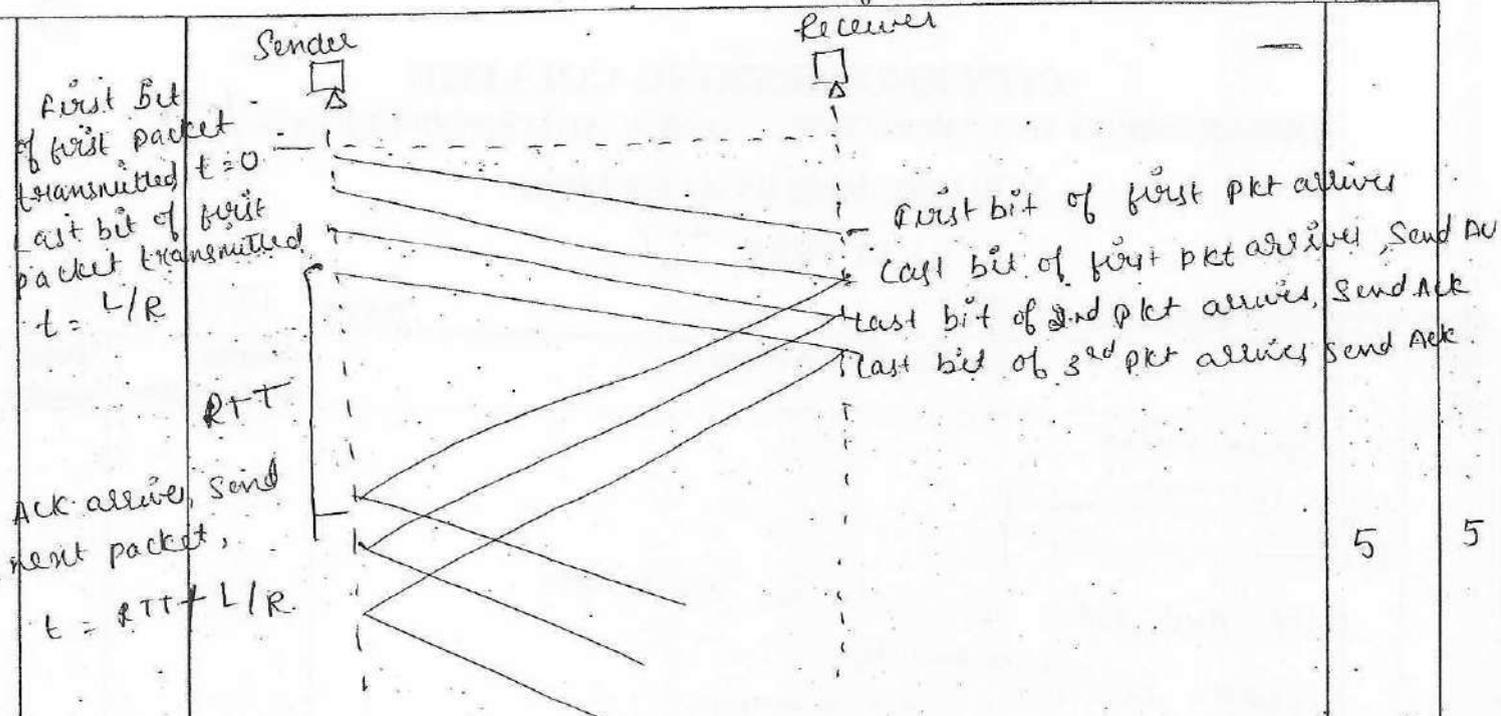
SEMESTER & SECTION: V, A&B

DATE: 10/12/2022

Q. No	Details of the Answer	Marks Distribution	Total marks
5a.	<p>Stop and wait protocol in operation</p> <p>A pipelined protocol in operation</p> <p>Sender Receiver</p> <p>first bit of first packet $t=0$</p> <p>Last bit of first packet $t=L/R$</p> <p>RTT</p> <p>ACK arrives, Send next packet</p> <p>$t = RTT + L/R$</p> <p>Stop and wait operation.</p> <p>first bit of first packet arrives</p> <p>Last bit of first packet arrives, Send ACK.</p>		

Staff Signature:

[Handwritten Signature]
HOD

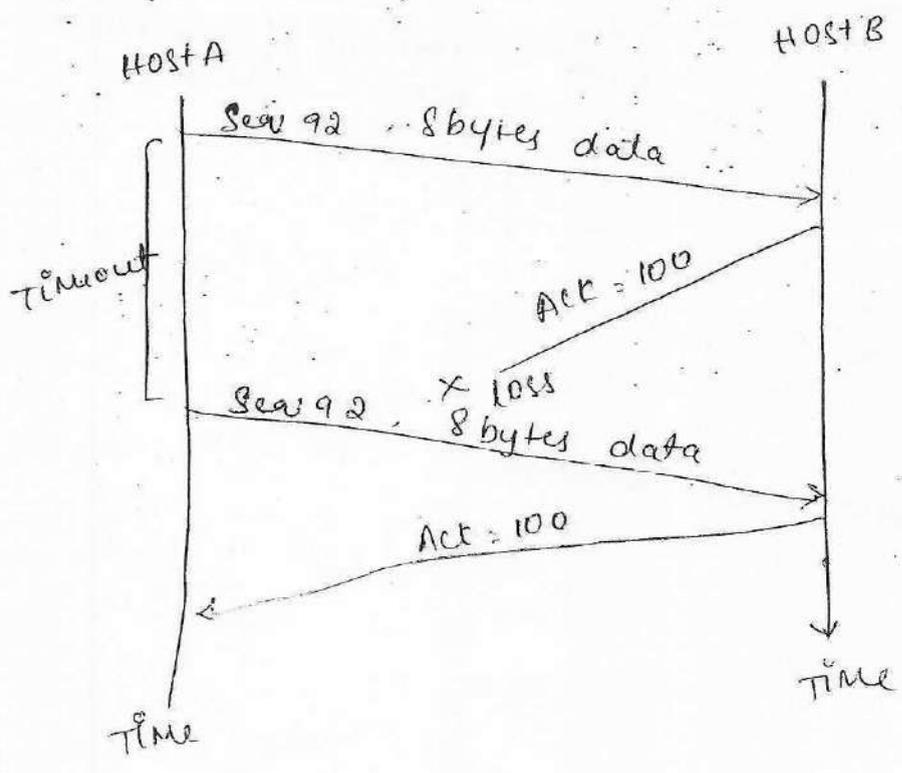


5

5

Pipelined operation
Explanation

- 5b:
- > CP achieves reliable mission by
 - > Retransmission
 - > cumulative ACK
 - > Fast Retransmit



Question No	Details of the Answer	Marks Total Distribution	Total Marks
6.	<p>Sender Receiver</p> <p>Send Pkt 0 Send Pkt 1 Send Pkt 2 (X (loss)) Send Pkt 3 (wait) Rev ACK 0 Rev ACK 1 Send Pkt 5 Rpt 2 timeout Send Pkt 2 Send Pkt 3 Send Pkt 4 Send Pkt 5</p> <p>Recv Pkt 0 Send ACK 0 Recv Pkt 1 Send ACK 1 Recv Pkt 3, discard Send ACK 1 Recv Pkt 4, discard Send ACK 1 Recv Pkt 5, discard Send ACK 1 Recv Pkt 2, deliver Send ACK 2 Recv Pkt 3, deliver Send ACK 3</p> <p>Explanation in detail Go-Back-N in operation</p>	10	10

CITY ENGINEERING COLLEGE
 DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING /ISE

SCHEME FOR EVALUATION

CIE TEST 2

SEMESTER & SECTION: V, A & B

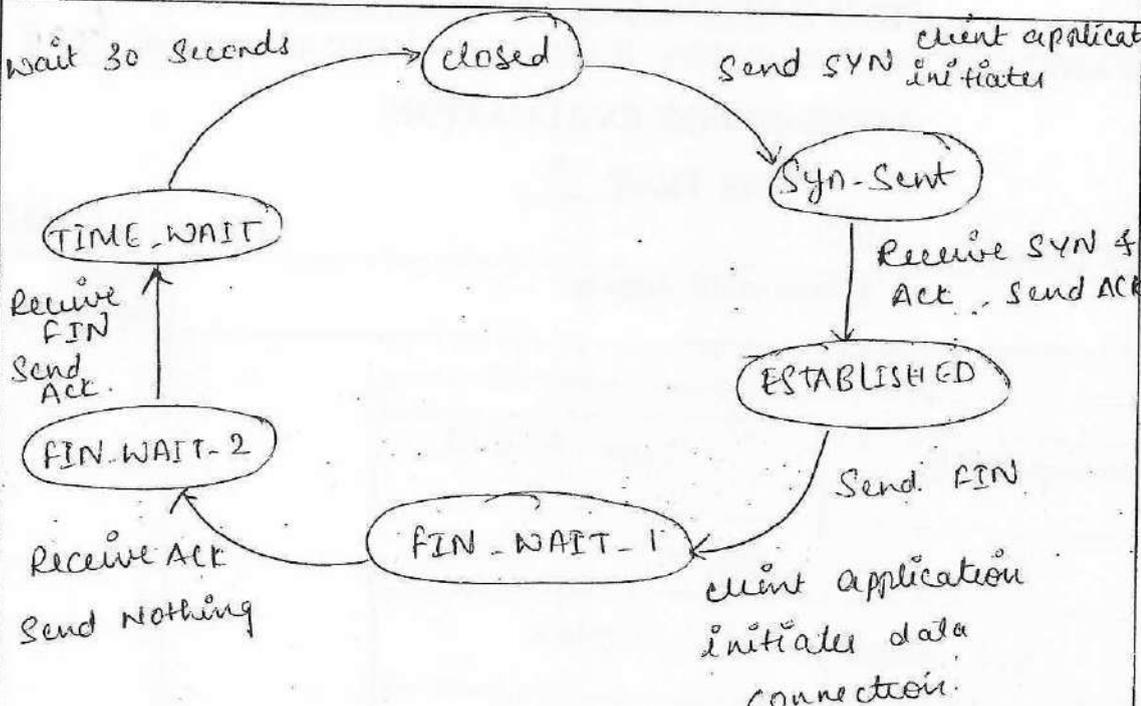
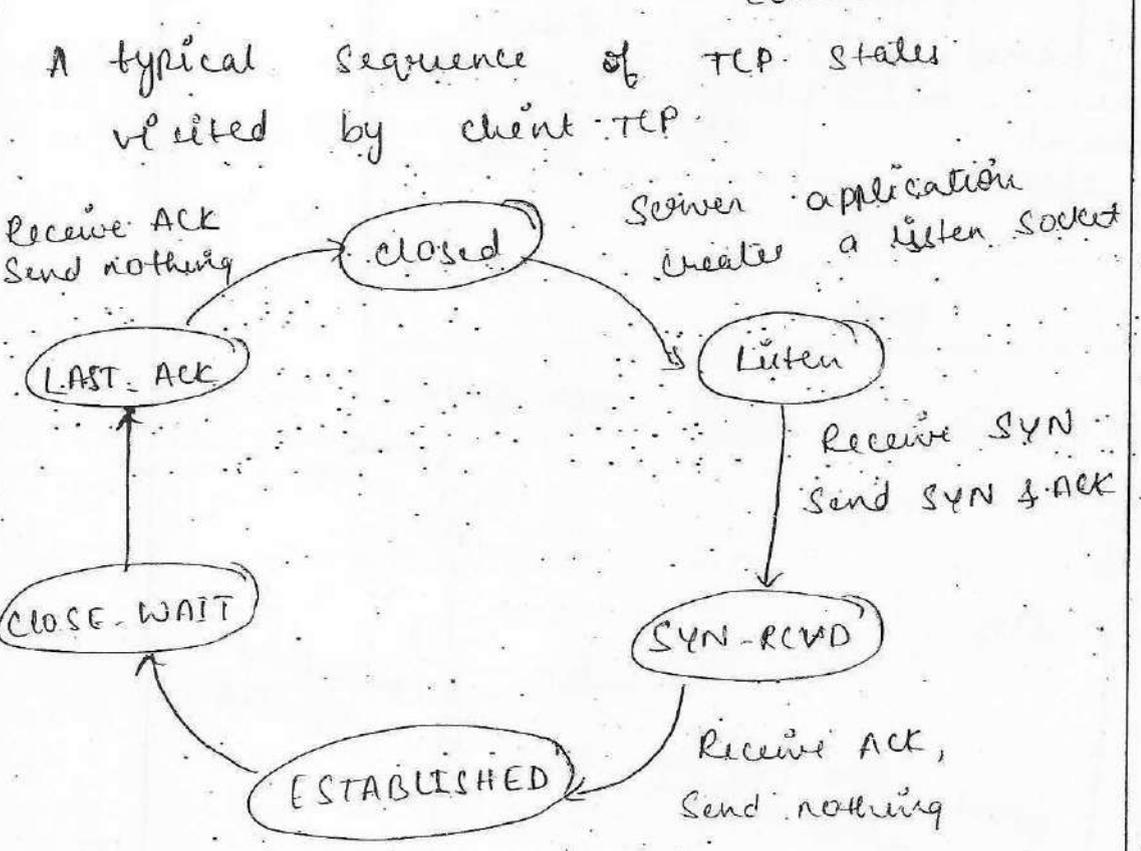
DATE: 12/12/22

Q. No	Details of the Answer	Marks Distribution	Total marks
7.	<p align="center">32 bits.</p>	10	10
8.	<p align="center">Detail explanation about each field.</p>	5	

TCP three way handshake.

Staff Signature:

[Signature]
HOD

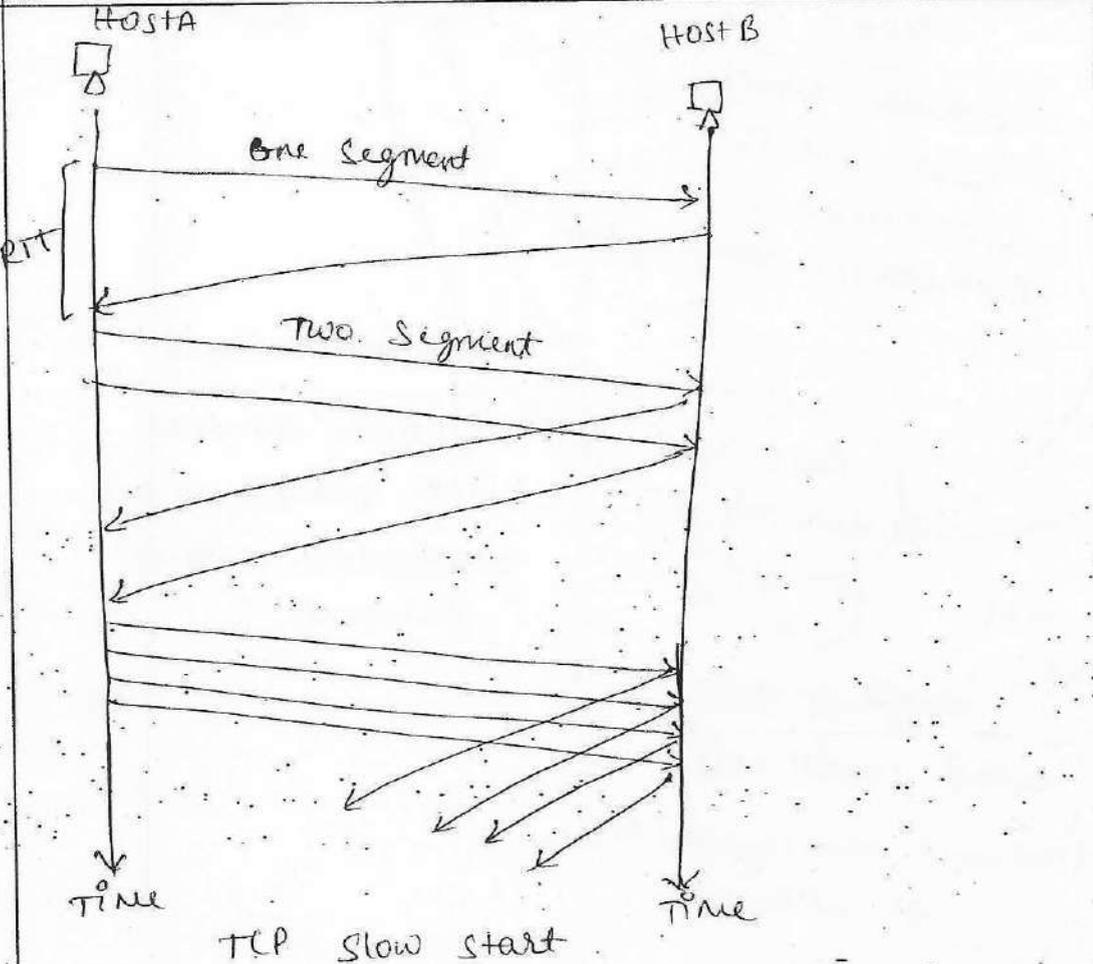
Q. No	Details of the Answer	Marks Distribution	Total marks
	<p>wait 30 seconds</p>  <p>client application initiates</p> <p>Receive SYN & ACK - Send ACK</p> <p>Send FIN</p> <p>client application initiates data connection</p> <p>Receive ACK</p> <p>Send Nothing</p> <p>Receive FIN</p> <p>Send ACK</p> <p>wait 30 seconds</p> <p>A typical sequence of TCP states visited by client TCP</p>  <p>Server application creates a listen socket</p> <p>Receive SYN</p> <p>Send SYN & ACK</p> <p>Receive ACK, Send nothing</p> <p>Receive ACK</p> <p>Send nothing</p> <p>Listen</p> <p>closed</p> <p>LAST-ACK</p> <p>CLOSE-WAIT</p> <p>ESTABLISHED</p> <p>SYN-RCVD</p> <p>A typical sequence of TCP states visited by a server-side TCP</p> <p>Explanation</p>	5	5

CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING / ISE
SCHEME FOR EVALUATION

CIE TEST 2

SEMESTER & SECTION: V, A & B

DATE: 10/12/22

Q. No	Details of the Answer	Marks Distribution	Total marks
9.	 <p> Congestion control Detailed Explanation about Slow start Congestion avoidance Fast Recovery with FSM description </p>		

Staff Signature:

[Handwritten Signature]
HOD

Q. No	Details of the Answer	Marks Distribution	Total marks
	<p>Slow Start</p> <ul style="list-style-type: none"> Initial state: $cwnd = 1$, $ssthresh = 64 \text{ KB}$, $dupAck = 0$ On duplicate ACK: $dupAck \text{ count}++$ On new ACK: $cwnd = cwnd + MSS$, $dupAck \text{ count} = 0$ When $cwnd > ssthresh$, transition to congestion avoidance. On timeout: $ssthresh = cwnd / 2$, $cwnd = 1$, $dupAck \text{ count} = 0$. Retransmit missing segment. On duplicate ACK: $cwnd = cwnd + MSS$, transmit new segment(s) as allowed. <p>congestion avoidance</p> <ul style="list-style-type: none"> On duplicate ACK: $dupAck \text{ count}++$ On duplicate ACK (count=3): $ssthresh = cwnd / 2$, $cwnd = ssthresh + 3 \cdot MSS$, retransmit missing segment. <p>fast recovery</p> <ul style="list-style-type: none"> On duplicate ACK: $cwnd = cwnd + MSS$, transmit new segment(s) as allowed. <p>FSM description of TCP congestion control</p> <p>Multiplexing & Demultiplexing</p>	<p>10</p> <p>5</p>	<p>10</p> <p>5</p>

CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING / ISE
SCHEME FOR EVALUATION
CIE TEST 2

SEMESTER & SECTION: V A&B

DATE: 10/12/22

Q. No	Details of the Answer	Marks Distribution	Total marks
105	<p>Transport Layer lies just above the NW layer in protocol stack.</p> <p>Logical communication running on different host.</p> <p>→ NW layer provides logical communication b/w hosts.</p> <p>Detailed Explanation -</p>	5	5

Staff Signature:


HOD

CITY ENGINEERING COLLEGE
THIRD INTERNAL TEST

Branch: CSE
Subject Name: Computer Network and Security
Semester: V SEM
Section: A & B

Date: 11/01/2023
Sub Code: 18CS52

Time: 2:30AM to 4:00PM

Max Marks: 50

Note: Answer any FIVE questions choosing at least ONE from each.

Q.no	Part A	Marks	CO	BT
1.	Explain Distance Vector Algorithm with an example	10	CO3	BT 2, BT 3
OR				
2.	Discuss about uncontrolled flooding and controlled flooding in broadcast routing algorithm	10	CO3	BT 1, BT 2
Part B				
3.	Write link State algorithm and apply it for the following graph with source node <div style="text-align: center;"> </div>	10	CO3	BT 1, BT 2 BT 3
OR				
4	Explain three switching techniques in router	10	CO3	BT 1, BT 2
Part C				
5	Explain IPV6 datagram format		CO3	BT 1, BT 2
OR				
6.	Explain 4 types of hierarchical OSPF routers	10	CO3	BT 1, BT 2
Part D				
7.	Explain the intra AS routing protocol: RIP in detail	10	CO3	BT 1, BT 2
OR				
8.	Illustrate how a computer receives IP address using DHCP protocol.	10	CO3	BT 1, BT 2
Part E				
9.	Compare and contrast IPv4 and IPv6 header fields. Do they have any fields in common. Explain	10	CO1 CO2 CO3	BT 1, BT 2
OR				

10	Describe in detail about DHCP protocol.	10	CO3	BT1, BT 2
----	---	----	-----	--------------

Blooms Taxonomy Levels (BTL):

BT1- Remembering the concepts **BT2-** Understanding **BT3 –** Applying **BT4 –** Analyzing **BT5-** Evaluating

Course Outcomes (CO's):

CO2: Discuss transport layer services and understand UDP and TCP protocols

CO3: Explain routers, IP and Routing Algorithms in network layer

CITY ENGINEERING COLLEGE
 DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
 SCHEME FOR EVALUATION

/ISE

CIE TEST 3

SEMESTER & SECTION: V A&B

DATE: 9/10/23

Q. No	Details of the Answer	Marks Distribution	Total
1.	<p>Distance vector Routing Algorithm</p> <p>Let $d_x(y)$ be the cost of least-cost path from node x to node y.</p> $d_x(y) = \min_v \{ c(x,v) + d_v(y) \}$ <p>where \min_v in the equation is taken over all x's neighbours.</p> <div style="text-align: center;"> </div> <p>Each node x begins with $D_x(y)$ as estimate of least-cost path from itself to node y for all nodes in N.</p> <p>Let $D_x = [D_x(y) : y \text{ in } N]$ be node x's distance vector.</p> <p>With DV algorithm, each node x maintains the following routing information</p> <ul style="list-style-type: none"> • for each neighbour v, the cost $c(x,v)$ from x to directly attached neighbor v • Node x's distance vector, i.e. $D_x = [D_x(y) : y \text{ in } N]$ <p>containing x's estimate of its cost to all destinations y in N.</p>		

Staff Signature: _____

The distance vector of each of its neighbors,
i.e. D_v : $[D_v(y) : y \text{ in } N]$ for each
neighbor v of x .

At each node x :

Initialization

for all destinations y in N :

$D_x(y) = c(x, y) / *$ if y is not a neighbor
then $c(x, y) = \infty$ ~~*~~

for each neighbor w

Send distance vector $D_w = [D_w(y) : y \text{ in } N]$ to w

loop

wait (until I see a link cost change to

some neighbor w or until I receive

a distance vector from some neighbor w)

for each y in N

$D_x(y) = \min_v \{c(x, v) + D_v(y)\}$

if $D_x(y)$ changed for any destination y

Send distance vector

$D_x = [D_x(y) : y \text{ in } N]$ to all neighbors

forever.

CITY ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING / ISE
SCHEME FOR EVALUATION

CIE TEST 3

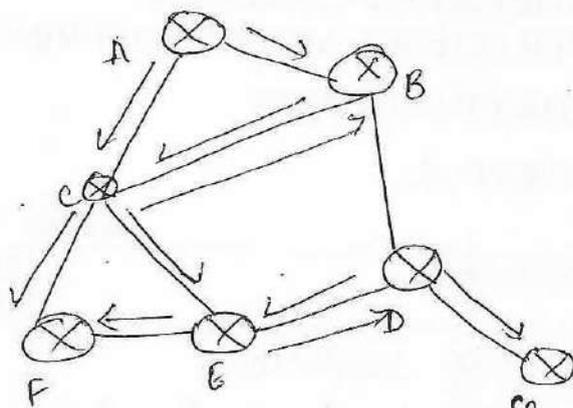
SEMESTER & SECTION: V A & B

DATE: 9/10/23

Q. No	Details of the Answer	Marks Distribution	Total mark
2.	<p>The technique for achieving broadcast is flooding in which some node sends a copy of packet to all its neighbors.</p> <p>When a node receives a broadcast packet, it duplicates the packet and forwards it all of its neighbors.</p> <div style="display: flex; justify-content: space-around;"> <div> <p>Source duplication</p> </div> <div> <p>duplication in network</p> </div> </div> <p>Controlled flooding</p> <p>In sequence - no. controlled flooding</p> <p>at source node puts its address as well as broadcast sequence number into a broadcast packet.</p> <p>Reverse path forwarding</p>	5	

Staff Signature

HOI

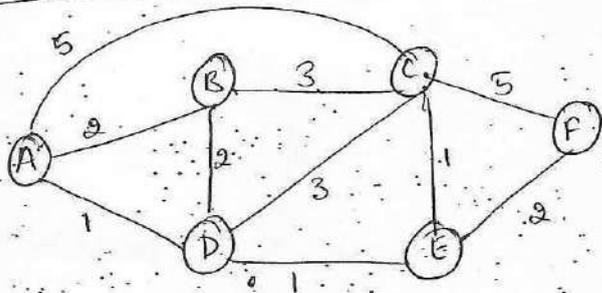


Reverse path forwarding

Spanning tree Broadcast

3.

Link State Algorithm



LS Algorithm for source node u

Initialization

$$N' = \{u\}$$

for all nodes v

if v is a neighbor of u

$$\text{then } D(v) = c(u, v)$$

$$\text{else } D(v) = \infty$$

Loop

find w not in N' such that $D(w)$ is a minimum

add w to N'

update $D(v)$ for each neighbor v of w

and not in N'

5

10

CITY ENGINEERING COLLEGE
 DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING / ISE
 SCHEME FOR EVALUATION

CIE TEST 8

SEMESTER & SECTION: V, A & B

DATE: 9/10/23

Q. No	Details of the Answer	Marks Distribution	Total mark			
	$D(v) = \min (D(v), D(w) + c(w,v))$ <p>/* new cost to v is either old cost to v or known least cost to w plus cost from w to v */</p> <p>until $N' = N$</p>	5	10			
<u>Soln</u>						
Step	N'	$D(v), P(v)$	$D(w), P(w)$	$D(x), P(x)$	$D(y), P(y)$	$D(z), P(z)$
0	0	2, u	5, u	1, u	∞	5
1	u, x	2, u	4, x		∞	8
2	u, x, y	2, u	3, y			4, y
3	u, x, y, v	0	3, y			4, y
4	u, x, y, v, w					
5	u, x, y, v, w, z					
4.	IPv6 datagram format					5

HOD

32 bits

Version	Traffic class	Flow Label		
Payload	Length	Next hop	Hop Limit	
Source address (128 bits)				
Destination address (128 bits)				
Data				

10

10

Explanation of every field.

⑥ 4 types of hierarchical OSPF Router.

OSPF is considered as successor to RIP.

It is a link state protocol that uses

flooding of link state information and a

Dijkstra's least cost path algorithm.

• Multiple same cost paths when multiple paths to a destination have the same cost, OSPF allows to use multiple paths.

• Integrated support for unicast and multicast routing. use the existing OSPF link db and add a new type of link state advertisement to the existing OSPF link state broadcast mechanism.

• Support for hierarchy within a single routing domain.

With each area, one or more area border routers are responsible for routing packets.

CITY ENGINEERING COLLEGE
 DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING / ISE
 SCHEME FOR EVALUATION

CIE TEST 3

SEMESTER & SECTION: 5th A & B

DATE:

Q. No	Details of the Answer	Marks Distribution	Total marks												
7.	<p>Exactly one OSPF area in the AS is configured to be the backbone area.</p> <p>RIP - Routing Information protocol.</p> <ul style="list-style-type: none"> → It is a distance-vector protocol that operates in a manner → In RIP costs are actually from source router to destination subnet. → RIP uses the term hop - no of subnets traversed along the shortest path from source router to destination subnet. → In RIP routing updates are exchanged b/w neighbors approximately every 30 sec. using RIP response message. → Response message also known as RIP advertisements. <p>Number of hops from source router A to various subnets</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Destination</th> <th>HOPS</th> </tr> </thead> <tbody> <tr><td>V</td><td>1</td></tr> <tr><td>W</td><td>2</td></tr> <tr><td>X</td><td>2</td></tr> <tr><td>Y</td><td>3</td></tr> <tr><td>Z</td><td>3</td></tr> </tbody> </table>	Destination	HOPS	V	1	W	2	X	2	Y	3	Z	3	10	10
Destination	HOPS														
V	1														
W	2														
X	2														
Y	3														
Z	3														

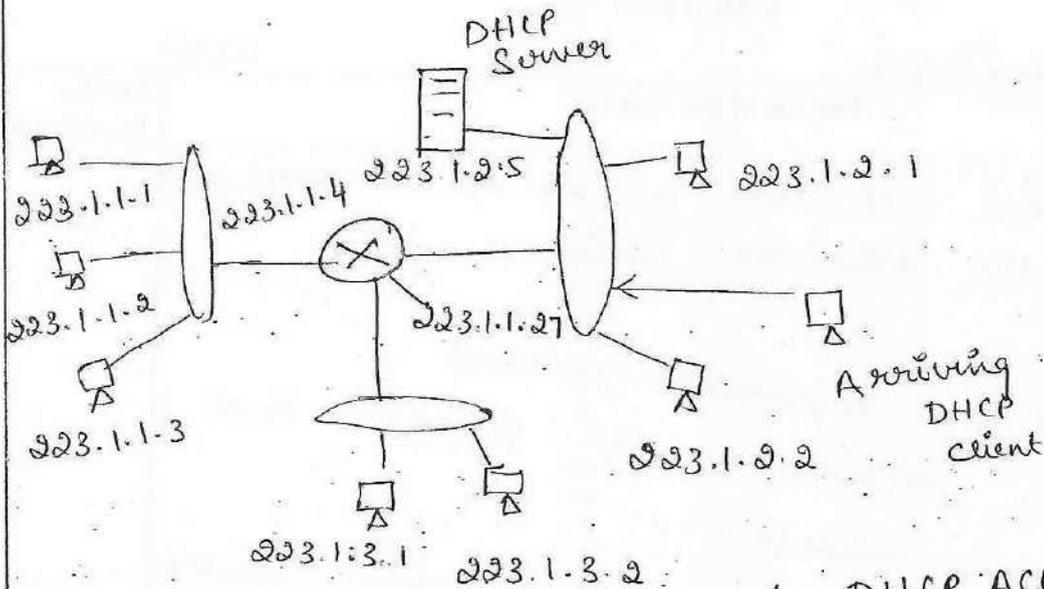
HOD *Avy*

Detailed explanation of RIP Advertisement and Routing table.

10

10

8.



DHCP server offer, DHCP request, DHCP ACK



10

10

CITY ENGINEERING COLLEGE
 DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING /ISE
 SCHEME FOR EVALUATION

CIE TEST 3

SEMESTER & SECTION: V A&B

DATE: 9/10/23

Q. No	Details of the Answer	Marks Distribution	Total mark																																												
9.	<p>IPv6 datagram format, 32 bits</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 25%;">Version</td> <td style="width: 25%;">Traffic class</td> <td colspan="2">Flow Label</td> </tr> <tr> <td colspan="2">Payload length</td> <td>Next hop</td> <td>HOP Limit</td> </tr> <tr> <td colspan="2">Source address (128 bits)</td> <td colspan="2">Destination address (128 bits)</td> </tr> <tr> <td colspan="4" style="text-align: center;">Data</td> </tr> </table> <p>IPv4 datagram format, 32 bits</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 20%;">Version</td> <td style="width: 20%;">Header length</td> <td style="width: 20%;">Type of Service</td> <td style="width: 40%;">Datagram length</td> </tr> <tr> <td colspan="3">16 bit Identifier</td> <td>Flags Fragment offset</td> </tr> <tr> <td>TTL</td> <td>Upper Layer protocol</td> <td colspan="2">Header checksum</td> </tr> <tr> <td colspan="4">32 bit Source IP address</td> </tr> <tr> <td colspan="4">32 bit Destination IP address</td> </tr> <tr> <td colspan="4" style="text-align: center;">Option (if any)</td> </tr> <tr> <td colspan="4" style="text-align: center;">Data</td> </tr> </table> <p>Detailed explanation about each field with comparison.</p>	Version	Traffic class	Flow Label		Payload length		Next hop	HOP Limit	Source address (128 bits)		Destination address (128 bits)		Data				Version	Header length	Type of Service	Datagram length	16 bit Identifier			Flags Fragment offset	TTL	Upper Layer protocol	Header checksum		32 bit Source IP address				32 bit Destination IP address				Option (if any)				Data				5	
Version	Traffic class	Flow Label																																													
Payload length		Next hop	HOP Limit																																												
Source address (128 bits)		Destination address (128 bits)																																													
Data																																															
Version	Header length	Type of Service	Datagram length																																												
16 bit Identifier			Flags Fragment offset																																												
TTL	Upper Layer protocol	Header checksum																																													
32 bit Source IP address																																															
32 bit Destination IP address																																															
Option (if any)																																															
Data																																															

[Signature]
HOD

Q. No	Details of the Answer	Marks Distribution	Total marks
-------	-----------------------	--------------------	-------------

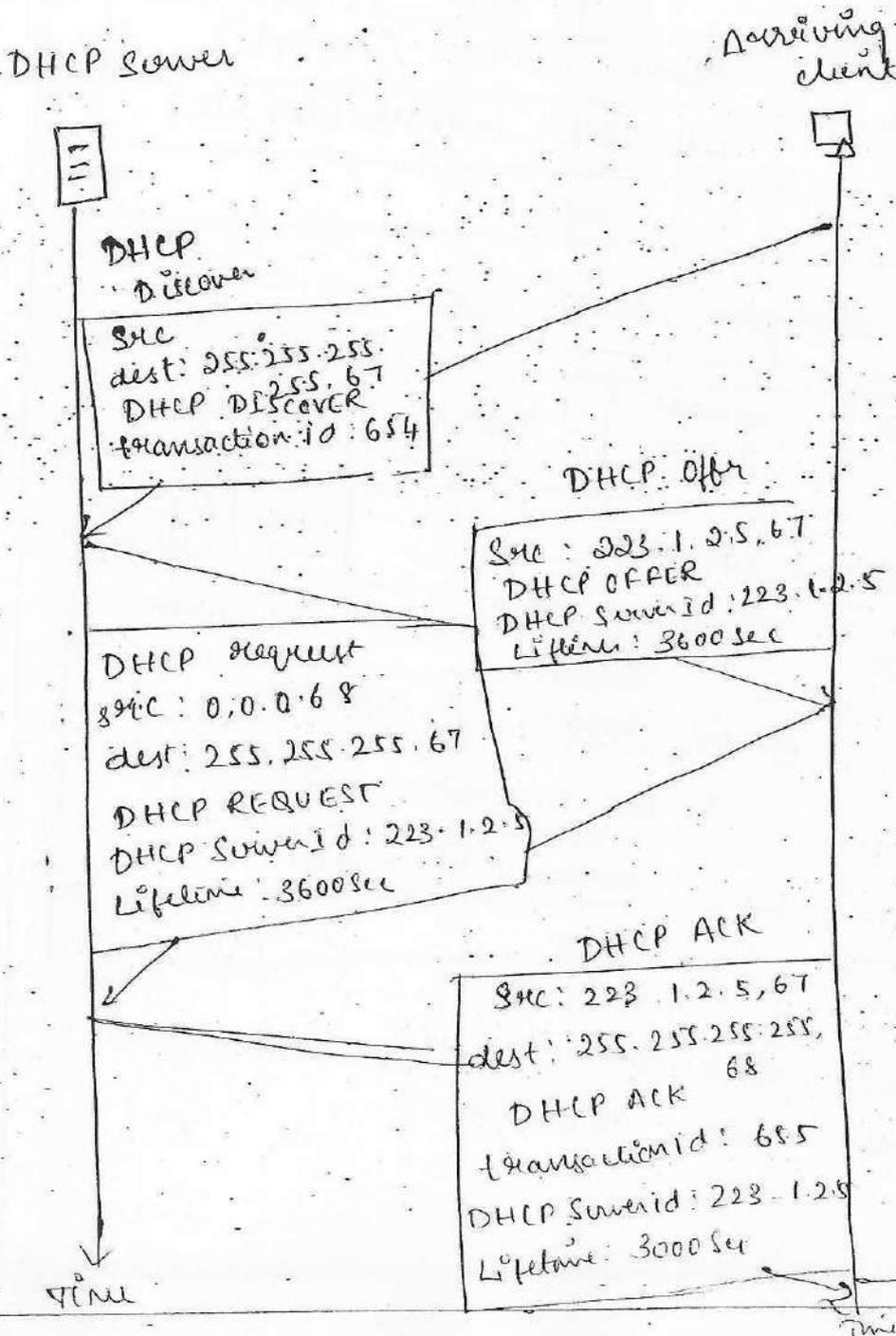
10. DHCP protocol.

→ DHCP server offers()

DHCP offer message is broadcast to all nodes on the subnet using IP broadcast address of 255.255.255.255.

→ DHCP request

→ DHCP ACK



10 10

CIRCULAR

Ref No: CEC/ME/DAC/ACY 2022-2023/02

Date: 08-02-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 08-02-2023 at 10: 00 AM in ME department.

Agenda:

- Planning of Internships, Project work & Technical Seminar for 8th semester students.
- Involving students in technical activities.
- Planning of AICTE activity report for 8th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning of Course preference, Course allocation & Work load distribution for upcoming even semester.

S Karunakara

Dr.S.Karunakara

HOD

DEPARTMENT OF MECHANICAL ENGINEERING

Department Advisory Committee Meeting

Date: 16/09/2022

Time: 10:00 AM

Venue: ME Department

DAC Members Present:

Sl. No	Member Name	Designation	Role	
1	Dr. S Karunakara	HOD	Convenor	<i>[Signature]</i>
2	Dr. Uma T R	Professor	Member	<i>[Signature]</i>
3	Mr. Mathenulla Shariff	Professor	Co-Convenor	<i>[Signature]</i>
4	Harsha Vardhan U	Assistant Professor	Member	<i>[Signature]</i>
5	Anil Kumar R	Assistant Professor	Member	<i>[Signature]</i>
6	Shruti Naik	Assistant Professor	Member	<i>[Signature]</i>
7	Vijay Kumar	Assistant Professor	Member	<i>[Signature]</i>
8	Sampath H P	Assistant Professor	Member	<i>[Signature]</i>
9	Rakesh Y D	Assistant Professor	Member	<i>[Signature]</i>
10	Shivaraja H B	Assistant Professor	Member	<i>[Signature]</i>
11	Bharath P T	Assistant Professor	Member	<i>[Signature]</i>
12	Shashank	Consultant	Alumni	<i>[Signature]</i>

The Department Advisory Committee meeting was conducted at Department of ME, on 8th February, 2023, at 10 AM.

Agenda of the Meeting:

- Planning of Internships, Project work & Technical Seminar for 8th semester students.
- Involving students in technical activities.
- Planning of AICTE activity report for 8th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning of Course preference, Course allocation & Work load distribution for upcoming even semester.

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The HOD welcomed all the staff for the meeting. The following points were discussed as follows.

- Committee members suggested establishing MOUs with various Construction & Building valuation industries to provide students with internship & project work opportunities.
- It was proposed to conduct a workshop, seminars & guest lecture on recent trending topics.
- The staff members were informed to conduct classes and labs regularly, to timely conduct and complete the entrusted responsibility, to actively participate in the dept and college activities and finally to take suitable actions for getting results and admissions to the dept.
- The guide has to check and discuss about the internship practice taken by students allocated to him or she.
- The staff members should complete all the five modules and work hard to get 100% pass percentage. The staff members should find out the reasons for poor percentage in the concerned subject and submit report.

HOD thanked all the staff for having attended the meeting.

S. Karunakara

Dr.S.Karunakara

HOD



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23(EVEN)

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/	Signature
			Semester	
1	Dr. S Karunakara	21ME65B, BCEDK203	VI, II	
2	Dr. Uma T R	18ME652, 18ME82	VI, VIII	
3	Mr. Mathenulla Shariff	18ME43, BCSCK204D	IV, II	
4	Harsha Vardhan U	18ME61, 18ME41	VI, IV	
5	Anil Kumar R	18ME81, BCEDK203	VIII, II	
6	Shruti Naik	18ME42, BCEDK203	IV, II	
7	Vijay Kumar	18ME61, BCSCK204D	VI, II	
8	Sampath H P	18ME62, 18ME43	VI, IV	
9	Rakesh Y D	18ME42, BCSCK204D	IV, II	
10	Shivaraja H B	18ME62, 18ME81	VI, VIII	
11	Bharath P T	18ME42, 18ME83	IV, VIII	

HOD



ACADEMIC YEAR: 2022-23 (Even)

Department of Mechanical Engineering

COURSE PREFERENCE

Name of the Faculty: Harsha Vardhan. U

Designation: Assistant professor.

Sl. No	Course Code and Name	Year/Semester
1	18ME63/HT	III / VI
2.	BCSEK204D/Introduction to Mechanical Engineering	II / III
3.	BCEDK203/CAED	II / III


Signature of Faculty



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (Odd SEM)& Even SEM, Department of Mechanical Engineering

Feb 2023		March 2023		April 2023		May 2023		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
WED	1	1st Sem –I CIE	1	1st Sem –II CIE				
THU	2		2					
FRI	3		3					
SAT	4		4		1	III SEM LAST WORKING DAY III test DIP		
SUN	5		5		2			
MON	6		6	I test -DIP	3	III test DIP & II test -8thsem 1st sem practical exam	1	KARMIKARA DINACHARANE
TUE	7		7	I test-DIP	4	3 rd sem practical exam	2	
WED	8		8	Women's day	5		3	
THU	9	5 th sem practical ends	9		6		4	
FRI	10	Talents day	10		7	GOOD FRIDAY	5	
SAT	11	2 nd Saturday holiday	11	2 nd Saturday holiday	8	2 nd Saturday holiday	6	2 nd Saturday holiday
SUN	12		12		9		7	
MON	13	8 th sem commencement	13	I test 8 th Sem	10		8	III test-8 th sem
TUE	14		14		11		9	
WED	15		15	3 rd sem-III CIE &II test	12		10	
THU	16	5 th sem theory exam starts	16	3 rd sem-III CIE &II test	13		11	
FRI	17		17	3 rd sem-III CIE &II test	14	Dr. B. R. AMBEDKAR JAYANTI	12	
SAT	18	MAHA SHIVARATHRI	18	5 th sem theory exam ends	15		13	
SUN	19		19		16		14	
MON	20		20	6 th semester commencement	17	I st & 3rd sem theory Examination	15	Commencement of II/IV SEM
TUE	21		21		18		16	
WED	22		22	CHANDRAMANA UGADI	19		17	
THU	23		23		20		18	
FRI	24		24		21		19	
SAT	25	4 th Saturday holiday	25	4 th Saturday holiday	22	Alumni day	20	4 th Saturday holiday
SUN	26		26		23		21	
MON	27		27	1st sem –III CIE	24		22	
TUE	28		28		25		23	
WED			29		26		24	
THU			30		27		25	
FRI			31	I SEM LAST WORKING DAY- COLLEGE DAY	28		26	
SAT					29		27	
SUN					30		28	
MON							29	
TUE							30	
WED							31	

Signature

CITY ENGINEERING COLLEGE
(Doddakallsandra, Off Kanakapura Road, Bangalore-560061)
Department of Mechanical Engineering



Faculty Academic File

NAME: HARSHA VARDHAN U.

DESIGNATION: ASSISTANT PROFESSOR

SEMESTER: 06

SECTION: 'A'

SUBJECT NAME & CODE: HT & 18ME63

ACADEMIC YEAR: 2022-2023

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

Individual Time Table 2022-2023 TIME TABLE

Faculty: Harsha Vardhan U

DAY	1		2		TEA	3		4		LUNCH	5		6		7	
	9:00 AM	10:00 AM	10:00 AM	11:00 AM		11:00 AM	11:15 AM	12:15 AM	12:15 PM		1:15 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	
MON	18ME63							21ME43								
TUE	21ME43							18ME63								
WED			18ME63						21ME43							
THU							21ME43		18ME63							
FRI				18ME63					21ME43							
SAT																

L U N C H

B R E A K

S. Kowhan

HEAD OF THE DEPARTMENT
 Mechanical Engineering
 CITY ENGINEERING COLLEGE
 Daddakallasandra, Kanakapura Main Road
 BANGALORE - 560 061
 HOD, Dept. of ME



VISVESVARAYA TECHNOLOGICAL UNIVERSITY
CITY ENGINEERING COLLEGE
DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Name of the staff: **HARSHA VARDHAN U**

Dept: **Mechanical Engineering**

Class: **6th sem**

Subject: **Heat Transfer (18ME63)**

Sl.No.	Date	Topics to be covered
1.	17/4/23	Module 1: Introductory concepts and definitions: Modes of heat transfer: Basic laws governing conduction, convection, and radiation heat transfer;
2.	18/4/23	Types of boundary conditions. General three dimensional Heat Conduction Equation: Derivation of the equation in (i) Cartesian, coordinate only.
3.	19/4/23	Discussion of three dimensional Heat Conduction Equation in (ii) Polar and (iii) Spherical Co-ordinate Systems.
4.	24/4/23	Steady-state one-dimensional heat conduction problems in Cartesian System: Steady-state one-dimensional heat conduction problems (i) without heat generation and (ii) constant thermal conductivity - in Cartesian system with various possible boundary conditions.
5.	25/4/23	Brief Introduction to variable thermal conductivity and heat generation [No numerical on variable thermal conductivity and heat generation] Thermal Resistances in Series and in Parallel.
6.	26/4/23	Critical Thickness of Insulation in cylinder and spheres Concept. Derivation
7.	02/5/23	Numerical problems
8.	03/5/23	Numerical problems
9.	08/5/23	Module-2, Extended Surfaces or Fins: Classification, Straight
10.	09/5/23	Rectangular and Circular Fins
11.	10/5/23	Temperature Distribution and Heat Transfer Calculations,
12.	15/5/23	Fin Efficiency and Effectiveness, Applications
13.	16/5/23	Transient [Unsteady-state] heat conduction: Definition, Different cases - Negligible internal thermal resistance, negligible surface resistance,
14.	17/5/23	comparable internal thermal and surface resistance, Lumped body
15.	23/5/23	Infinite Body and Semi-infinite Body,
16.	24/5/23	Numerical Problems, Heisler and Grober charts.
17.	29/5/23	Module 3: Numerical Analysis of Heat Conduction: Introduction, one-dimensional steady conduction
18.	30/5/23	One dimensional unsteady conduction,
19.	5/6/23	boundary conditions, solution methods.
20.	6/6/23	Thermal Radiation: Fundamental principles - Gray, White, Opaque, Transparent and Black bodies, Spectral emissive power,
21.	7/6/23	Wien's displacement law, Planck's laws, Hemispherical Emissive Power,
22.	12/6/23	Stefan-Boltzmann law for the total emissive power of a black body, Emissivity and Kirchhoff's Laws,
23.	13/6/23	View factor, Net radiation exchange between parallel plates,
24.	14/6/23	concentric cylinders, and concentric spheres, Radiation Shield.
25.	15/6/23	Module 4: Forced Convection: Boundary Layer Theory, Velocity and Thermal Boundary Layers, Prandtl number,
26.	16/6/23	Turbulent flow, Various empirical solutions, Forced convection flow over cylinders and spheres,

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING
EVEN 2022-2023 TIME TABLE

CLASS ROOM:A306

W.E.F : 05-06-2023

SEMESTER: IV ME 'A'

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	21MAT41	21ME45	B R E A K	21ME42	21ME43	L U N C H	21MEL46		
TUE	21ME43	21ME42		21MAT41	21ME44		tutorials		
WED	21MAT41	21ME45		21ME44	21ME43		21ME48X		
THU	21ME42	21ME45		21ME43	tutorials		Tutorials		
FRI	21ME44	21MAT41		21ME42	tutorials		Tutorials		
SAT	INTERSHIP PRESENTATION			NSS/SPORTS					

S. Karhana

HEAD OF THE DEPARTMENT
Mechanical Engineering
CITY ENGINEERING COLLEGE
Doddakallasandra, Kanakapura Main Road
BANGALORE - 560 061
HOD, Dept. of ME

(Signature)

PRINCIPAL
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING
EVEN 2022-2023 TIME TABLE

SEMESTER: VI ME 'A'

CLASS ROOM: A305

W.E.F : 20-03-2023

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00 AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	18ME63	18ME641	B R E A K	18ME61	18ME62	L U N C H	18MEL66		
TUE	18ME61	18ME641		18ME62	18ME63		18MEL67		
WED	18ME62	18ME63		18ME62	18ME61				
THU	18ME653	18ME61		18ME653	18ME63				
FRI	18ME653	18ME61		18ME641	18ME63				
SAT									

S. Kulkarni

HEAD OF THE DEPARTMENT
Mechanical Engineering
CITY ENGINEERING COLLEGE
Doddakallas. HOD, Dept. of ME, Main Road
BANGALORE - 560 051



PRINCIPAL
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 051

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING
EVEN 2022-2023 TIME TABLE

SEMESTER: VIII ME 'A'

CLASS ROOM:304

W.E.F : 13-02-2023

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	18ME824	18ME81	B R E A K	18ME824	TUT	L U N C H	18MES84		
TUE	18ME81	18ME81		18ME824	TUT		18MEI85		
WED	18MEP83			18MEP83			18MEP83		
THU									
FRI									
SAT									

S. Kulkarni

HEAD OF THE DEPARTMENT
Mechanical Engineering
CITY ENGINEERING COLLEGE
HOD, Dept. of ME
Doddakallasandra, Kanakapura Main Road
BANGALORE - 560 061



PRINCIPAL
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE		
DEPARTMENT OF MECHANICAL ENGINEERING		
HEAT TRANSFER - 18ME63		
SL NO.	USN	STUDENT NAME
1	1CE20ME001	SUHAS B
2	1CE20ME002	ABHILASH SUVAN



S. Karthik

B. E. MECHANICAL ENGINEERING Choice Based Credit System (CBCS) and Outcome Based Education (OBE) SEMESTER - VI HEAT TRANSFER			
Course Code	18ME63	CIE Marks	40
Teaching Hours /Week (L:T:P)	3:2:0	SEE Marks	60
Credits	04	Exam Hours	03
Course Learning Objectives: <ul style="list-style-type: none"> • Study the modes of heat transfer. • Learn how to formulate and solve 1-D steady and unsteady heat conduction problems. • Apply empirical correlations for fully-developed laminar, turbulent internal flows and external boundary layer convective flow problems. • Study the basic principles of heat exchanger analysis and thermal design. • Understand the principles of boiling and condensation including radiation heat transfer related engineering problems. 			
Module-1			
Introductory concepts and definitions: Modes of heat transfer: Basic laws governing conduction, convection, and radiation heat transfer; Types of boundary conditions. General three dimensional Heat Conduction Equation: Derivation of the equation in (i) Cartesian, coordinate only. Discussion of three dimensional Heat Conduction Equation in (ii) Polar and (iii) Spherical Co-ordinate Systems.			
Steady-state one-dimensional heat conduction problems in Cartesian System: Steady-state one-dimensional heat conduction problems (i) without heat generation and (ii) constant thermal conductivity - in Cartesian system with various possible boundary conditions. Brief Introduction to variable thermal conductivity and heat generation [No numerical on variable thermal conductivity and heat generation] Thermal Resistances in Series and in Parallel. Critical Thickness of Insulation in cylinder and spheres Concept. Derivation			
Module-2			
Extended Surfaces or Fins: Classification, Straight Rectangular and Circular Fins, Temperature Distribution and Heat Transfer Calculations, Fin Efficiency and Effectiveness, Applications			
Transient [Unsteady-state] heat conduction: Definition, Different cases - Negligible internal thermal resistance, negligible surface resistance, comparable internal thermal and surface resistance, Lumped body, Infinite Body and Semi-infinite Body, Numerical Problems, Heisler and Grober charts.			
Module-3			
Numerical Analysis of Heat Conduction: Introduction, one-dimensional steady conduction and one dimensional unsteady conduction, boundary conditions, solution methods.			
Thermal Radiation: Fundamental principles - Gray, White, Opaque, Transparent and Black bodies, Spectral emissive power, Wien's displacement law, Planck's laws, Hemispherical Emissive Power, Stefan-Boltzmann law for the total emissive power of a black body, Emissivity and Kirchhoff's Laws, View factor, Net radiation exchange between parallel plates, concentric cylinders, and concentric spheres, Radiation Shield.			
Module-4			
Forced Convection: Boundary Layer Theory, Velocity and Thermal Boundary Layers, Prandtl number, Turbulent flow, Various empirical solutions, Forced convection flow over cylinders and spheres, Internal flows –laminar and turbulent flow solutions.			
Free convection: Laminar and Turbulent flows, Vertical Plates, Vertical Tubes and Horizontal Tubes, Empirical solutions.			
Module-5			

Heat Exchangers: Definition, Classification, applications, LMTD method, Effectiveness - NTU method, Analytical Methods, Fouling Factors, Chart Solution Procedures for solving Heat Exchanger problems: Correction Factor Charts and Effectiveness-NTU Charts.

Introduction to boiling: pool boiling, Bubble Growth Mechanisms, Nucleate Pool Boiling, Critical Heat Flux in Nucleate Pool Boiling, Pool Film Boiling, Critical Heat Flux, Heat Transfer beyond the Critical Point, filmwise and dropwise Condensation.

Course Outcomes: At the end of the course, the student will be able to:

CO1: Understand the modes of heat transfer and apply the basic laws to formulate engineering systems.

CO2: Understand and apply the basic laws of heat transfer to extended surface, composite material and unsteady state heat transfer problems.

CO3: Analyze heat conduction through numerical methods and apply the fundamental principle to solve radiation heat transfer problems.

CO4: Analyze heat transfer due to free and forced convective heat transfer.

CO5: Understand the design and performance analysis of heat exchangers and their practical applications, Condensation and Boiling phenomena.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub- questions) from each module.
- Each full question will have sub- question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Principals of heat transfer	Frank Kreith, Raj M. Manglik, Mark S. Bohn	Cengage learning	Seventh Edition 2011.
2	Heat transfer, a practical approach	Yunus A. Cengel	Tata Mc Graw Hill	Fifth edition
Reference Books				
1	Heat and mass transfer	Kurt C, Rolle	Cengage learning	second edition
2	Heat Transfer A Basic Approach	M. Necati Ozisik	McGraw Hill, New York	2005
3	Fundamentals of Heat and Mass Transfer	Incropera, F. P. and De Witt, D. P	John Wiley and Sons, New York	5th Edition 2006
4	Heat Transfer	Holman, J. P.	Tata McGraw Hill, New York	9th Edition 2008

S. K. Kulkarni

USN

--	--	--	--	--	--	--	--	--	--

COURSE CODE: 18ME63

CITY
ENGINEERING COLLEGE
FIRST INTERNAL TEST

PROGRAMME: MECHANICAL ENGINEERING
COURSE NAME: HEAT TRANSFER
SEM: 6TH 'A'

DATE: 03/05/2023
TIME: 10:30AM – 12:00PM

Duration: 1.30 Hrs

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART - A	M	CO'S	BT'S
1.	Define with appropriate expressions: (i) Heat Flux (ii) Thermal Conductivity (iii) Thermal Diffusivity (iv) HTC (v) Thermal Contact Resistance.	10	C01 C02	BT1 BT2
OR				
2.	Briefly narrate the modes of heat transfer & explain the laws governing them.	10	C01 C02	BT1 BT2
PART - B				
3.	Derive a general expression for 3-D heat conduction equation in Cartesian co-ordinates for isotropic material.	10	C01 C02	BT1 BT2
OR				
4.	Derive a general expression for 1-D heat conduction equation in Cartesian co-ordinates for isotropic material.	10	C01 C02	BT1 BT2
PART-C				
5.	Briefly describe the boundary conditions of I, II & III kinds.	10	C01 C02	BT1 BT2
OR				
6.	A furnace wall is made up of three layers of thickness 250mm, 100mm & 150mm with thermal conductivities of 1.65, k & 9.2 W/m ⁰ C respectively. The inside is exposed to gases at 1250 ⁰ C with a convection co-efficient of 25W/m ² ⁰ C & the inside surface is at 1100 ⁰ C, the outside surface is exposed to air at 25 ⁰ C with convection coefficient of 12W/m ² ⁰ C. Determine: (i) The unknown thermal conductivity 'k' (ii) The overall HTC (iii) All surface temperatures.	10	C01 C02	BT2 BT2
PART-D				
7.	A standard cast iron pipe (inner diameter = 50mm & outer diameter = 55mm) is insulated with 85% magnesium insulation (k=0.02 W/m ⁰ C). Temperature at the interface between the pipe & insulation is 300 ⁰ C. The allowable heat loss through the pipe is 600W/m length of pipe & for the safety, the temperature of the outside surface of insulation must not exceed 100 ⁰ C. Determine : (i) Minimum thickness of insulation required, and (ii) The temperature of inside surface of the pipe assuming its thermal conductivity 20 W/m ⁰ C.	10	C01 C02	BT3
OR				

8.	A furnace wall is composed of 220mm of fire brick, 150mm of common brick, 50mm of 85% magnesia & 3mm of steel plate on the outside. If the inside surface temperature is 1500°C & outside surface temperature is 90°C, estimate the temperatures between layers & calculate the heat loss in kJ/h-m ² C. Assume, k (for fire brick) =4 kJ/m-h ⁰ C, k (for common brick) =2.8 kJ/m-h ⁰ C, k (for 85% magnesia) =0.24 kJ/m-h ⁰ C, k (for steel) =240 kJ/m-h ⁰ C.	10	C01 C02	BT1 BT2
PART-E				
9.	Derive a general expression for 1-D heat conduction equation in Cylindrical co-ordinates & mention their assumptions.	10	C01 C02	BT3 BT4
OR				
10.	A 240mm steam main, 210 meters long is covered with 50mm of high temperature insulation (k=0.092 W/m ⁰ C) & 40mm of low temperature insulation (k=0.062 W/m ⁰ C). The inner & outer surface temperatures as measured are 390°C & 40°C respectively. Calculate: (i) The total heat loss per hour. (ii) The heat loss per m ² of pipe surface. (iii) The total heat loss per m ² of outer surface & (iv) The temperature between two layers of insulation. Neglect heat conduction through pipe material.	10	C01 C02	BT3 BT4

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analyzing BT5- Evaluating BT6- Creating.

Course outcomes (CO's)

C01: Understand the basic modes of heat transfer.

C02: Compute the temperature distribution in steady-state & unsteady-state Conduction.

CITY ENGINEERING COLLEGE
DEPARTMENT OF Mechanical Engineering

SCHEME FOR VALUATION

Semester & Section: 6th 'A' Internal Test 01

Date: 03/05/2022

Question No.	Details of the Answer	Marks Distribution	Total Marks
	<u>PART-A:</u>		
1.	Define each along with eqns.	02x5=10	10.
	(OR)		
2.	③ Modes of H.T. — — Conduction — Fourier's law — Convection — Newton's law — Radiation — Stefan-Boltzmann law		10.
	<u>PART-B:</u>		
3.	3-D Cond. Eqn — derivation. $\frac{\partial^2 T}{\partial x^2} + \frac{\partial^2 T}{\partial y^2} + \frac{\partial^2 T}{\partial z^2} + \frac{q_g}{k} = \frac{1}{\alpha} \cdot \frac{\partial T}{\partial t}$ Sketch derivation.	02 01 07	10.
	(OR)		
4.	1-D Cond. Eqn — derivation. $\frac{\partial^2 T}{\partial x^2} + \frac{q_g}{k} = \frac{1}{\alpha} \cdot \frac{\partial T}{\partial t}$ Sketch derivation	02 01 07	10.
	<u>PART-C:</u>		
5.	③ B.C's Each B.C's Sketch	03x03=09 01x01=01	10.
	(OR)		

[Handwritten signature]

S. Kulkarni

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	$q = 1225 \text{ W}$ $k = 2.817 \text{ W/m}^\circ\text{C}$ $U = 3.06 \text{ W/m}^2\text{C}$ $t_2 = 531.8^\circ\text{C}$ $t_3 = 398^\circ\text{C}$ $t_4 = 337.5^\circ\text{C}$ Sketch - 01	$6+3+1=10$	10.
7.	<p style="text-align: center;"><u>PART D:-</u></p> $Q/L = 600 \text{ W/m}$ $r_3 = 0.0287 \text{ m}$ $t_1 = 300.45^\circ\text{C}$ Sketch data <div style="text-align: center;">(OR)</div>	02 03 03 01 01	10.
8.	Sketch data $t_1 = 200^\circ\text{C}$ $t_2 = 90^\circ\text{C}$ $t_3 = 25^\circ\text{C}$ Substn <p style="text-align: center;"><u>PART E:-</u></p>	01 01 $02 \times 3 = 06$ 02	10.
9.	1-D cylindrical Eqn. $\frac{1}{r} \cdot \frac{\partial}{\partial r} \left(r \cdot \frac{\partial T}{\partial r} \right) + \frac{1}{r^2} \cdot \frac{\partial^2 T}{\partial \theta^2} = \frac{1}{\alpha} \cdot \frac{\partial T}{\partial t}$ Sketch derivation <div style="text-align: center;">(OR)</div>	02 02 06	10.
10.	Sketch data $Q = 231029.6 \text{ KJ/hr.}$ $Q/A = 1459. \text{ KJ/hr.}$ $\text{outg } Q = 834.03 \text{ KJ/hr.}$ $t_2 = 205.8^\circ\text{C}$ <u>ansd ad. 2</u>	01 01 02 02 02 02	10.

USN

--	--	--	--	--	--	--	--	--	--

COURSE CODE: 18ME63

CITY
ENGINEERING COLLEGE
SECOND INTERNAL TEST

PROGRAMME: MECHANICAL ENGINEERING

COURSE NAME: HEAT TRANSFER

SEM: 6TH 'A'

Duration: 1.30 Hrs

DATE: 09/06/2023

TIME: 10:30am – 12:00 pm

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART – A	M	CO'S	BT'S
1.	Derive an expression for the temperature distribution for a long pin of uniform cross section without insulated tip.	10	C02 C03	BT1 BT2
OR				
2.	Explain physical significance of Biot number and Fourier number.	04	C03	BT1 BT2
	Obtain an expression for instantaneous heat transfer and total heat transfer for lumped heat analysis treatment of heat conduction problem.	06		BT1 BT2
PART – B				
3.	Define Hydrodynamic and Thermal boundary layer in case of flow over a flat plate.	05	C04	BT1 BT2
	Explain the physical significance of the following: (a) Reynolds number (b) Nusselt number (c) Prandtl number (d) Grashoff number (e) Stanton number.	05		BT1 BT2
OR				
4.	With the help of dimensional analysis, derive expression for the Reynolds number, Prandtl number and Nusselt number.	10	C04	BT1 BT2
PART-C				
5.	Define critical thickness of insulation and explain physical significance of critical thickness of insulation? Derive an expression for critical thickness of insulation for a cylinder.	10	C02 C03	BT1 BT2
OR				
6.	Define (i) Fin Efficiency (ii) Fin Effectiveness.	04	C03	
	Superheated steam at 330°C is flowing at 20m/s velocity ($h=110 \text{ W/m}^2\text{C}$) through a pipe 120mm in diameter. The temperature of steam is to be measured by putting a pocket in the pipe of 15mm diameter (inside) and 1mm wall thickness. The thermal conductivity of the material of the pocket is 50 W/m°C. (i) Determine the length of insertion so that thermometric error is 0.5%. Find also the temperature measured if the pipe wall temperature is 40°C. (ii) What will be the actual error in temperature measurement in °C if	06	C03	BT3 BT4 BT5

	the depth of immersion is 55mm only and the pipe wall temperature is 40°C?			
PART-D				
7.	A rod ($K=200 \text{ W/mK}$) 10mm in diameter and 5cm long has its one end maintained at 100°C. The surface of the rod is exposed to ambient air at 30°C with convective heat transfer co-efficient of 100 W/m ² K. Assuming other end insulated, determine (i) The temperature of the rod at 25 mm distance from the end at 100°C. (ii) Heat dissipation rate from the surface of the rod. (iii) Effectiveness. With a neat sketch explain the error estimation in temperature measurement.	06	C03	BT3 BT4 BT5
		04	C02 C03	BT2
OR				
8.	Derive an expression for temperature distribution and heat dissipation in a straight fin of a rectangular profile for the fin insulated at the tip.	10	C03	BT1 BT3
PART-E				
9.	A 15mm diameter mild steel sphere ($K=42 \text{ W/m}^0\text{C}$) is exposed to cooling airflow at 20°C resulting in the convective coefficient $h=120 \text{ W/m}^2\text{C}$. Determine the following: (i) Time required to cool the sphere from 550°C to 90°C. (ii) Instantaneous heat transfer rate 2min after the start of cooling. (iii) Total energy transferred from the sphere during the first 2min. For mild steel take: $\rho=7850\text{kg/m}^3$, $C=475 \text{ J/kg}^0\text{C}$ & $\alpha=0.045 \text{ m}^2/\text{h}$.	10	C03	BT3 BT4 BT5
OR				
10.	An aluminium alloy plate of 400mm*400mm*4mm size at 200°C is suddenly quenched into liquid oxygen at -183°C. Starting from fundamentals or deriving the necessary expression, determine the time required for the plate to reach a temperature of -70°C. Assume $h=20000 \text{ kJ/m}^2\text{-h}^0\text{C}$, $C_p=0.8\text{kJ/kg}^0\text{C}$ & $\rho=3000\text{kg/m}^3$. A Steel ball 100mm in diameter and initially at 900°C is placed in air at 30°C. Find: (i) Temperature of the ball after 30 sec. (ii) The rate of cooling (°C/min) after 30 sec. Take $h= 20 \text{ W/m}^2\text{C}$, $k \text{ (steel)} = 40 \text{ W/m}^0\text{C}$, $\rho_{\text{steel}}=7800\text{kg/m}^3$, $C=460 \text{ J/kg}^0\text{C}$.	05	C03	BT3 BT4 BT5
		05	C03	BT3 BT4 BT5

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analyzing BT5- Evaluating
BT6- Creating.

Course outcomes (CO's)

CO2: Compute temperature distribution in steady-state and unsteady-state heat conduction.
CO3: Understand and interpret heat transfer through extended surfaces.
CO4: Interpret and compute Forced and Free Convective heat transfer.

CITY ENGINEERING COLLEGE
DEPARTMENT OF Mechanical Engineering

SCHEME FOR VALUATION

Semester & Section: 6th 'A'

Internal Test 02

Date: 01/06/2023

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<u>PART-A:-</u> Sketch derivation $\frac{\cosh m(L-x) + (h/mk) \sinh m(L-x)}{\cosh mL + (h/mk) \sinh mL}$	01 07 02	10.
2.	(OR) (a) Biot no Fouier no (b) Instantaneous Q.T, $Q_i = -hAs (t_i - t_a) e^{-Bi \cdot Fo}$ Total H.T.R, $Q' = Svc (t_i - t_a) [e^{-Bi \cdot Fo} - 1]$	02 } 04 02 } 03 } 03 } 06	10.
3.	<u>PART-B:-</u> (a) Defn of each layer (b) sign. of each non-dimensional no (OR)	$2 \frac{1}{2} \times 2 = 05$ $01 \times 5 = 05$	10.
4.	$\pi_1 = \frac{u}{SDV}$ $\pi_2 = \frac{CpSVD}{k}$ $\pi_3 = \frac{k}{hD}$ $Nu = C(Re)^m \cdot (Pr)^n$	03 x 3 = 09 01	10.
5.	<u>PART-C:-</u> Defn Exp. of phy. sign Sketch + Derivation	01 01 02+06	10.

[Handwritten signature]

S. Karthi

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	<p style="text-align: center;">(OR)</p> (a). Each Defn along Eqn. (b). $m = 48.35$ $L = 124 \text{ mm}$ $t_1 = 328.55^\circ\text{C}$ $(t_1 - t_f) = -43.7^\circ\text{C}$	$02 \times 2 = 04$ 01 01 02 } 06 02	10.
7.	<p style="text-align: center;"><u>PART-D:-</u></p> (a). $T = 650^\circ\text{C}$ $v = 25.2 \text{ W/m}^2$ $\eta = 39.4 \approx 40\%$ (b). Sketch Explan	02 02 } 06 02 02 } 04 02	10.
8.	<p style="text-align: center;">(OR)</p> Sketch derivation $\frac{\cosh m(L-x)}{\cosh(mL)}$ <p style="text-align: center;"><u>PART-E:-</u></p>	01 01 02	10.
9.	Data $\tau = 26 \text{ sec}$ $\phi' = 32.6 \text{ W/m}^2$ $Q = 48 \text{ kW}$ Substitution	02 02 02 02 02	10.
10.	<p style="text-align: center;">(OR)</p> (a). $A_s = 0.32 \text{ m}^2$, $V = 0.00064 \text{ m}^3$ $L_c = 0.002 \text{ m}$, $Bi = 0.0519$ $\tau = 1.0545$ (b). $L_c = 0.01667 \text{ m}$, $Bi = 0.008335$ $t = 891.3^\circ\text{C}$ $\frac{dt}{dt} = 217.23^\circ\text{C/min}$	01 02 } 05 02 02 } 05 01 02	10.

USN

--	--	--	--	--	--	--	--	--	--

COURSE CODE: 18ME63

CITY
ENGINEERING COLLEGE
THIRD INTERNAL TEST

PROGRAMME: MECHANICAL ENGINEERING

COURSE NAME: HEAT TRANSFER

SEM: 6TH 'A'

Duration: 1.30 Hrs

DATE: 13/07/2023

TIME: 10:30AM – 12:00PM

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART - A	M	CO'S	BT'S
1.	What is lumped parameter method? Derive temperature variation for instantaneous heat transfer & total heat transfer expressions for a transient heat conduction.	10	C03	BT1 BT2
OR				
2.	A vertical cooling fin approximating a flat plate 40cm in height is exposed to saturated steam at atmospheric pressure ($t_{sat}=100^{\circ}\text{C}$). The fin is maintained at a temperature of 90°C . Estimate the following (i) thickness of the film at the bottom of the fin, (ii) Overall HTC, (iii) Heat transfer rate after incorporating McAdams's correction. The relevant fluid properties are: $\rho_l=965.3 \text{ kg/m}^3$, $k_f=0.68 \text{ W/m}^{\circ}\text{C}$, $\mu_l=3.153 \times 10^{-4} \text{ N-s/m}^2$.	10	C05	BT1 BT2
PART - B				
3.	An iron sphere ($K=60\text{W/m}^{\circ}\text{C}$, $C=460\text{J/kgK}$, $\rho=7850\text{kg/m}^3$) of diameter 5cm is initially at a uniform temperature $T = 225^{\circ}\text{C}$. Suddenly the surface of the sphere is exposed to an ambient at 25°C with heat transfer coefficient $h = 500\text{W/m}^2\text{K}$. Calculate i. the center temperature at $t = 2\text{min}$ after start of the cooling ii. Temperature at a depth 1cm from the surface at time $t = 2\text{min}$ after start of cooling iii. Energy removed from the sphere during this time period.	10	C03	BT1 BT2
OR				
4.	(a) Draw the Boiling curve & discuss the different regimes of boiling heat transfer.	06	C05	BT1 BT2
	(b) Write a short note on: (i) Filmwise Condensation & (ii) Dropwise Condensation.	04	C05	BT1 BT2
PART-C				
5.	A vertical square plate $300\text{m} \times 300\text{m}$ is exposed to steam at atmospheric pressure. The plate temperature is 98°C . Calculate the heat transfer and the mass of steam condensed per hour	10	C05	BT1 BT2
OR				
6.	Explain the significance of Biot and Fourier numbers.	06	C03	BT2 BT2
	Write a note on Heister charts?	04	C03	BT2 BT2
PART-D				

7.	An aluminum wire, 1mm in diameter at 200°C is suddenly exposed to an environment at 30°C with $h=85.5 \text{ W/m}^2\text{K}$. Estimate the time required to cool the wire to 90°C, if the same wire were to place in air stream of $h=11.65 \text{ W/m}^2 \text{ K}$. What would be the time required to reach it to 90°C. Assume thermophysical properties $C=900 \text{ J/kg K}$, $\rho=2700 \text{ kg/m}^3$, $K=20 \text{ W/m K}$	05	C03	BT3
7.	An average human body modeled as a 30cm dia, 170cm long cylinder has 72% water by mass, so that its properties may be taken as those of water at room temperature $\rho= 1000\text{kg/m}^3$, $C=4180\text{J/kgK}$, $K=0.608\text{W/mK}$. A person is found dead at 5am in a room the temperature of which is 20°C. The temperature of the body is measured to be 25°C when found and the heat transfer coefficient is estimated to be $8\text{W/m}^2\text{K}$. Assuming the body temperature of a living man as 37°C, estimate the time of death of the above person.	05	C03	BT3
OR				
8.	The initial uniform temperature of a thick concrete wall ($a = 1.6 \times 10 \text{ m}^2/\text{s}$, $k=0.94 \text{ W/m}^\circ\text{C}$) of a jet engine test cell is 25°C. The surface temperature of the wall suddenly rises to 340°C when the combination of exhaust gases from the turbojet and spray of cooling water occurs. Determine: (i) The temperature at a point 80 mm from the surface after 8 hours. (ii) The instantaneous heat flow rate at the specified plane and at the surface itself at the instant mentioned at (i). Use the solution for semi-infinite solid.	10	C03	BT1 BT2
PART-E				
9.	A horizontal tube of outer diameter 20 mm is exposed to dry steam at 100°C. The tube surface temperature is maintained at 84°C by circulating water through it. Calculate the rate of formation of condensate per meter length of the tube.	10	C05	BT3 BT4
OR				
10.	(a) A steam condenser consisting of square array of 625 horizontal tubes, each 6mm in diameter, is installed at the exhaust hood of a steam turbine. The tubes are exposed to saturated steam at a pressure of 15kPa. If the tube surface temperature is maintained at 25°C, Calculate (i) The HTC, (ii) The rate at which steam is condensed per unit length of the tube.	10	C05	BT3 BT4

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analysing BT5- Evaluating BT6- Creating.

Course outcomes (CO's)

C05: Explain the principles of radiation heat transfer and understand the numerical formula for heat conduction problems.

CITY ENGINEERING COLLEGE
DEPARTMENT OF Mechanical Engg.....

SCHEME FOR VALUATION

Semester & Section: 7th 'A' & 'B' Internal Test 03

Date: 13/09/22

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<p align="center"><u>Part-A:-</u></p> Explan of lumped Method - Sketch - Delimitation	02 01 4+3	} 10.
2.	<p align="center">Ⓚ</p> Sketch Data $Q = 231099.6 \text{ kJ/kg}$ $Q/A = 1459. \text{ kJ/kg}$ out of $Q = 834.05 \text{ kJ/kg}$	01 01 03 02 02	} 10.
3.	<p align="center"><u>PART-B:-</u></p> <p align="center">Ⓚ</p> Sketch Data $Q/L = 600 \text{ W/m}$ $t_1 = 300.45^\circ\text{C}$	01 01 04 04	} 10.
4.	a) Sketch - 03 Explan of each stage b) Explan of each notes	$03 \times 1 = 03$ $01 \times 3 = 03$ $02 \times 2 = 04$	} 10.
5.	<p align="center"><u>Part-C:-</u></p> <p align="center">Ⓚ</p> Data $Q = 2371.13 \text{ W}$ $h = 13172.95 \text{ W/m}^2\text{K}$ $\mu_s = 3.78 \text{ kg/kg}$	02 02 04 02	} 10.

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	Sign of Each <u>no</u> (b) Sketch & Explan <u>Part-D:-</u>	$2 \times 3 = 06$ $02 + 02 = 04$	} 10.
7.	(a) Data $t = 3.2 \text{ sec}$ $t_{\text{reqd}} = 4.5$ (b) Data $t = 4.6 \text{ sec}$ <u>OR</u>	01 03 01 } 05 01 04 } 05	} 10.
8.	Data $t = 223.45^\circ\text{C}$ $Q_i = -1303.08 \text{ W/m}^2$ $Q_s = -1476.4 \text{ W/m}^2$ <u>Part-E:-</u>	01 03 03 03	} 6.
9.	Data $k = 11579.7 \text{ W/m}^\circ\text{C}$ $\frac{Q}{L} = 11641.2 \text{ W}$ $\frac{M}{L} = 18.56 \text{ kg/m}$ <u>OR</u>	02 03 03 02	} 6.
10.	Data $k = 4845.6 \text{ W/m}^\circ\text{C}$ $m_1 = 1.116 \times 10^{-3} \text{ kg/L}$ $m/N = 0.6975 \text{ kg/cm}$	02 03 03 02	} 6.

6th 'A' sec

Heat 7

ATTENDANCE

ASSESSMENT

Sl. No.	Reg.No.	Name	24/6	21/6	24/6	27/6	29/6	30/6	3/7	3/7	4/7	4/7	5/7					% of Attendance	Test Marks					Sessional Marks	Remarks		
			4	2	1	4	2	2	1	2	3	4	2	1	2	3	4		5	6	1	2	3			Totals	Average
			30	31	32	33	34	35	36	37	38	39	40	41	42	43	44		60	50	50	50	30			10	25/10
1	ICEZOME00	SUHAS. B.															95%	35	4	50	27	10	37				
2	ICEZOME002	ABHILASH SUVAN.															93.6	30	30	50	22	10	32				
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											
13																											
14																											
15																											
16																											
17																											
18																											
19																											
20																											
21																											
22																											
23																											
24																											
25																											
	No. of Abs.																										
	Initials																										

Handwritten initials and marks at the bottom of the page, including blue and red ink marks.

Name of the staff: HARSHA VARDHAN U

Dept: Mechanical Engineering

Class: 6th sem

Subject: Heat Transfer (18ME63)

Sl.No.	Date	Topics to be covered
1.	17/4/23	Module 1: Introductory concepts and definitions: Modes of heat transfer: Basic laws governing conduction, convection, and radiation heat transfer;
2.	18/4/23	Types of boundary conditions. General three dimensional Heat Conduction Equation: Derivation of the equation in (i) Cartesian, coordinate only.
3.	19/4/23	Discussion of three dimensional Heat Conduction Equation in (ii) Polar and (iii) Spherical Co-ordinate Systems.
4.	24/4/23	Steady-state one-dimensional heat conduction problems in Cartesian System: Steady-state one-dimensional heat conduction problems (i) without heat generation and (ii) constant thermal conductivity - in Cartesian system with various possible boundary conditions.
5.	25/4/23	Brief Introduction to variable thermal conductivity and heat generation [No numerical on variable thermal conductivity and heat generation] Thermal Resistances in Series and in Parallel.
6.	26/4/23	Critical Thickness of Insulation in cylinder and spheres Concept. Derivation
7.	02/5/23	Numerical problems
8.	03/5/23	Numerical problems
9.	08/5/23	Module-2, Extended Surfaces or Fins: Classification, Straight
10.	09/5/23	Rectangular and Circular Fins
11.	10/5/23	Temperature Distribution and Heat Transfer Calculations,
12.	15/5/23	Fin Efficiency and Effectiveness, Applications
13.	16/5/23	Transient [Unsteady-state] heat conduction: Definition, Different cases - Negligible internal thermal resistance, negligible surface resistance,
14.	17/5/23	comparable internal thermal and surface resistance, Lumped body
15.	23/5/23	Infinite Body and Semi-infinite Body,
16.	24/5/23	Numerical Problems, Heisler and Grober charts.
17.	29/5/23	Module 3: Numerical Analysis of Heat Conduction: Introduction, one-dimensional steady conduction
18.	30/5/23	One dimensional unsteady conduction,
19.	5/6/23	boundary conditions, solution methods.
20.	6/6/23	Thermal Radiation: Fundamental principles - Gray, White, Opaque, Transparent and Black bodies, Spectral emissive power,
21.	7/6/23	Wien's displacement law, Planck's laws, Hemispherical Emissive Power,
22.	12/6/23	Stefan-Boltzmann law for the total emissive power of a black body, Emissivity and Kirchhoff's Laws,
23.	13/6/23	View factor, Net radiation exchange between parallel plates,
24.	14/6/23	concentric cylinders, and concentric spheres, Radiation Shield.
25.	15/6/23	Module 4: Forced Convection: Boundary Layer Theory, Velocity and Thermal Boundary Layers, Prandtl number,
26.	16/6/23	Turbulent flow, Various empirical solutions, Forced convection flow over cylinders and spheres,

27.	19/6/23	Internal flows-laminar and turbulent flow solutions.
28.	20/6/23	Free convection: Laminar and Turbulent flows,
29.	21/6/23	Vertical Plates, Vertical Tubes and Horizontal Tubes, Empirical solutions.
30.	26/6/23	Numerical Problems.
31.	27/6/23	Numerical Problems.
32.	28/6/23	Numerical Problems.
33.	30/6/23	Module 5: Heat Exchangers: Definition, Classification, applications,
34.	3/7/23	LMTD method, Effectiveness - NTU method, Analytical Methods, Fouling Factors,
35.	3/7/23	Chart Solution Procedures for solving Heat Exchanger problems: Correction Factor Charts and Effectiveness-NTU Charts.
36.	4/7/23	Introduction to boiling: pool boiling, Bubble Growth Mechanisms, Nucleate Pool Boiling, Critical Heat Flux in Nucleate Pool Boiling,
37.	4/7/23	Pool Film Boiling, Critical Heat Flux, Heat Transfer beyond the Critical Point,
38.	5/7/23	Filmwise and dropwise Condensation.
39.	5/7/23	Numerical Problems.
40.	6/7/23	Numerical Problems.

Text Books:

1. Heat & Mass transfer, by Tirumaleshwar, Pearson-2006
2. Heat transfer, by P.K. Nag, Tata Mc Graw Hill 2002
3. Heat transfer-A basic approach, Ozisik, Tata McGraw Hill 2002

Reference Books:

1. Heat transfer, a practical approach, Yunus A- Cengel Tata Mc Graw Hill
2. Principles of heat transfer by Kreith Thomas Learning 2001
3. Fundamentals of heat and mass transfer by Frenk P. Incropera and David P. Dewitt, John Wiley and son's.
4. Heat and Mass Transfer, by B K Venkanna, Ellite Publisher, Mangalore.


Staff Signature


H O D

CIRCULAR

RefNo: CEC/ME/DAC/ACY 2022-2023/01

Date: 16-09-2022

This is to inform the members of Department Advisory Committee that meeting is scheduled on 16-09-2022 at 10: 00 AM in ME department.

Agenda:

- Planning of Internships & Project work for 7th semester students.
- Involving students in technical activities.
- Planning of AICTE activities for 7th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning to improve result of students.
- Planning of Course preference, Course allocation & Work load distribution for upcoming odd semester.

S Karunakara

Dr.S.Karunakara

HOD

DEPARTMENT OF MECHANICAL ENGINEERING

Department Advisory Committee Meeting

Date: 16/09/2022

Time: 10:00 AM

Venue: ME Department

DAC Members Present:

Sl. No	Member Name	Designation	Role	
1	Dr. S Karunakara	HOD	Convenor	<i>[Signature]</i>
2	Dr. Uma T R	Professor	Member	<i>[Signature]</i>
3	Mr. Mathenulla Shariff	Professor	Co-Convenor	<i>[Signature]</i>
4	Harsha Vardhan U	Assistant Professor	Member	<i>[Signature]</i>
5	Anil Kumar R	Assistant Professor	Member	<i>[Signature]</i>
6	Shruti Naik	Assistant Professor	Member	<i>[Signature]</i>
7	Vijay Kumar	Assistant Professor	Member	<i>[Signature]</i>
8	Sampath H P	Assistant Professor	Member	<i>[Signature]</i>
9	Rakesh Y D	Assistant Professor	Member	<i>[Signature]</i>
10	Shivaraja H B	Assistant Professor	Member	<i>[Signature]</i>
11	Bharath P T	Assistant Professor	Member	<i>[Signature]</i>
12	Shashank	Consultant	Alumni	<i>[Signature]</i>

The Department Advisory Committee meeting was conducted at Department of ME, on 16th September, 2022, at 10 AM.

Agenda of the Meeting:

- Planning of Internships & Project work for 7th semester students.
- Involving students in technical activities.
- Planning of AICTE activities for 7th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning to improve result of students.
- Planning of Course preference, Course allocation & Work load distribution for upcoming odd semester.

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The HOD welcomed all the staff for the meeting. The following points were discussed as follows.

- Strategy has to be made to improve admissions by visiting nearby diploma colleges to improve lateral entry. The responsibilities are given to Mr. Jayanth K S for identifying polytechnics in the near vicinity.
- It was proposed to conduct a workshop, seminars & guest lecture on recent trending topics.
- The staff members were informed to conduct classes and labs regularly, to timely conduct and complete the entrusted responsibility, to actively participate in the dept and college activities and finally to take suitable actions for getting results and admissions to the dept.
- The guide has to check and discuss about the internship practice taken by students of 7th semester allocated to him or she. The guide must visit the site where internship is practiced by the students and discuss with supervisor of students at the site. The staff members should complete all the five modules and work hard to get 100% pass percentage. The staff members should find out the reasons for poor percentage in the concerned subject and submit report.
- Ant ragging committee should go for inspection at least once in a day. Weekly reports should be submitted by respective faculties to the HOD.

HOD thanked all the staff for having attended the meeting.

S Karunakara

Dr.S.Karunakara

HOD



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (Odd SEM), Department of Mechanical Engineering

Feb 2023		March 2023		April 2023		May 2023		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
WED	1	1st Sem –I CIE	1	1st Sem –II CIE				
THU	2		2					
FRI	3		3					
SAT	4		4		1	III SEM LAST WORKING DAY III test DIP		
SUN	5		5		2			
MON	6		6	I test -DIP	3	III test DIP & II test -8thsem 1st sem practical exam	1	KARMIKARA DINACHARANE
TUE	7		7	I test-DIP	4	3 rd sem practical exam	2	
WED	8		8	Women's day	5		3	
THU	9	5 th sem practical ends	9		6		4	
FRI	10	Talents day	10		7	GOOD FRIDAY	5	
SAT	11	2 nd Saturday holiday	11	2 nd Saturday holiday	8	2 nd Saturday holiday	6	2 nd Saturday holiday
SUN	12		12		9		7	
MON	13	8 th sem commencement	13	I test 8 th Sem	10		8	III test-8 th sem
TUE	14		14		11		9	
WED	15		15	3 rd sem-III CIE & II test	12		10	
THU	16	5 th sem theory exam starts	16	3 rd sem-III CIE & II test	13		11	
FRI	17		17	3 rd sem-III CIE & II test	14	Dr. B. R. AMBEDKAR JAYANTI	12	
SAT	18	MAHA SHIVARATHRI	18	5 th sem theory exam ends	15		13	
SUN	19		19		16		14	
MON	20		20	6 th semester commencement	17	I st & 3rd sem theory Examination	15	Commencement of II/IV SEM
TUE	21		21		18		16	
WED	22		22	CHANDRAMANA UGADI	19		17	
THU	23		23		20		18	
FRI	24		24		21		19	
SAT	25	4 th Saturday holiday	25	4 th Saturday holiday	22	Alumni day	20	4 th Saturday holiday
SUN	26		26		23		21	
MON	27		27	1st sem –III CIE	24		22	
TUE	28		28		25		23	
WED			29		26		24	
THU			30		27		25	
FRI			31	I SEM LAST WORKING DAY- COLLEGE DAY	28		26	
SAT					29		27	
SUN					30		28	
MON							29	
TUE							30	
WED							31	

Start



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23 (ODD)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
COURSE PREFERENCE

Name of the Faculty: Dr. M.P. Matherulla Shariff
Designation: Professor

Sl. No	Course Code and Name	Year/Semester
1	1BCSK104D / Introduction to Mechanical Engrs.	I / I
2.	18ME54 - DME-I	III / V
3.	18MBL77 - Delegation	IV / V II


Signature of Faculty



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-2023
(ODD)

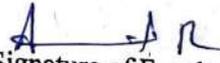
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

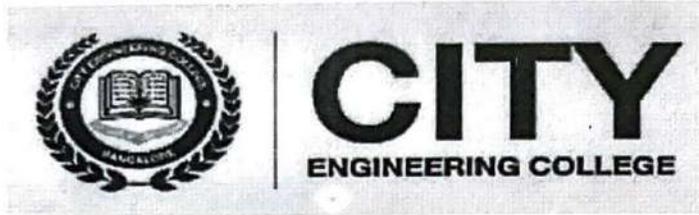
COURSE PREFERENCE

Name of the Faculty: Anil Kumar. R

Designation: Assistant professor.

Sl. No.	Course Code and Name	Year/Semester
1	BCEDR103/CAED	I/I
2.	18ME734/TQM	IV/VII
3.	18ME176/CFM lab	IV/VII


Signature of Faculty



ACADEMIC YEAR: 2022-23(ODD)

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/	Signature
			Semester	
1	Dr. S Karunakara	18ME754, 18ME51	VII, V	
2	Dr. Uma T R	18ME73, 18ME56	VII, V	
3	Mr. Mathenulla Shariff	BCSCK104D, 18ME55	I, V	
4	Harsha Vardhan U	18ME51, 18ME34	V, III	
5	Anil Kumar R	18ME32, BCSCK104D	III, I	
6	Shruti Naik	BCEDK103, 18ME35	I, III	
7	Vijay Kumar	18ME54, 18ME34	V, III	
8	Sampath H P	18ME71, 18ME31	III, VII	
9	Rakesh Y D	18ME72, 18ME33	VII, III	
10	Shivaraja H B	18ME31, 18ME56	III, V	
11	Bharath P T	BCEDK103, 18ME55	I, V	

HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2022-2023 TIME TABLE

SEMESTER: III ME 'A' SEC CBCS

2021 SCHEME

CLASS ROOM: A106

DAY	9:00 - 10:00 AM	10:00 - 11:00 AM	11:00 - 11:15 AM	11:15 AM - 12:15 PM	12:15 PM - 1:15 PM	LUNCH	2:00 – 3:00 PM	3:00 – 4:00 PM	4:00 – 5:00 PM
MON	21MAT31	21ME33	BREAK	21ME32	21ME34	L U N C H			
TUE	21ME33	21ME32		21MAT31	21ME34		21MEL35		
WED	21ME32	21ME33		21MAT34	21ME31				
THU	21ME34	21MAT31		21ME33	21ME32				
FRI	21ME33	21KSK37		21UH36			DEPARTMENT ACTIVITY		
SAT	NSS/SPORTS/YOGA BNSK359/BPEK359/BYO K359			NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK35 9					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
21MAT31	Transform Calculus, Fourier Series & numerical Techniques	Prof Vanitha G R
21ME32	Metal Casting, Forming & Joining process	Prof Anil Kumar R
21ME33	Material Science and Engineering	Prof Rakesh Y D
21ME34	Basic Thermodynamics	Prof Harshavardhan U
21MEL35	Machine Drawing	Prof Shruti Naik
21UH36	SCR	Prof Vinay Kumar H M
21KSK37	Samskrutika Kannada	Prof Deepa R

S. Kalyan
HOD, Dept. of ME

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2022-2023 TIME TABLE

SEMESTER: V ME 'A' SEC CBCS

2018 SCHEME

CLASS ROOM: A104

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	18ME51	18ME53	<i>B R E A K</i>	18ME581	18ME54	<i>L U N C H</i>	18MEL55		
TUE	18ME53	18ME54		18ME581	18ME52				
WED	18ME51	18ME581		18ME52	18ME54				
THU	18ME52	18ME53		18ME52	18ME54				
FRI	18ME52	18MEL581		18MEL53	18ME51				
SAT									

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18ME51	Management & Economics	Prof Shruti Naik
18ME52	Design of Machine Elements I	Prof Sampath H P
18ME53	Dynamics of Machines	Veeresh Naik
18ME54	Turbo Machines	Prof Vijay Kumar
18ME55	Fluid Power Engineering	Prof Anil Kumar
18ME56	Operations Management	Dr Uma T R
18MEL57	Fluid Mechanics Lab	Prof Harshavardhan U
18MEL58	Energy Conversion Lab	Prof Sampath H P

S. Karan
HOD, Dept. of ME

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2022-2023 TIME TABLE

SEMESTER: VII ME 'A' SEC CBCS

2018 SCHEME

CLASS ROOM: A106

DAY	1	2	TEA	3	4	LUNCH	5	6	7	
MON	18ME71	18ME734	BREAK	18ME72	18ME741	L U N C H	DESIGN LAB			
TUE	18ME72	18ME71		18ME741	18ME734		MAJOR PROJECT PHASE-I			
WED	18ME71	18ME72		18ME734	18ME741					
THU	18ME741	18ME71		18ME72	18ME734					
FRI	CIM LAB			MAJOR PROJECT PHASE-II			DEPARTMENT ACTIVITY			
SAT	NSS/SPORTS/YOGA BNSK359/BPEK359/BYO K359			NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK35 9						

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18ME71	Control Engineering	Dr. Uma T R
18ME72	CAD/CAM	Prof Rakesh Y D
18ME734	Total Quality Management	Shruti Naik
18ME741	Additive Manufacturing	Prof Anil Kumar
18ME754	Non-Conventional Energy Resources	Dr. S Karunakara
18MEL76	CIM LAB	Prof Shruti Naik
18MEL77	DESIGN LAB	Prof Sampath H P

S. Karunakar
HOD, Dept. of ME

CITY ENGINEERING COLLEGE
(Doddakallsandra, Off Kanakapura Road, Bangalore-560061)
Department of Mechanical Engineering



Faculty Academic File

NAME: Md. Mathenulla Shanif

DESIGNATION: Asst. Professor

SEMESTER: II

SECTION: D

SUBJECT NAME & CODE: Introduction to Mech. Engg.
BESCK104D

ACADEMIC YEAR: 2022-2023

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING
Individual Time Table 2022-2023 TIME TABLE

Faculty: Mohammed Mathenullah Shariff

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	EME-D		B R E A K		18ME62	L U N C H	18MEL66		
TUE				18ME62	21ME44				
WED	18ME62			18ME62	EME-D				
THU					21ME44				
FRI	21ME44								
SAT	EME-D								

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

21EME15/25

First/Second Semester B.E. Degree Examination, June/July 2023 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

- Note:** 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of Steam table is permitted

Module-1

- 1 a. Enumerate the roles of mechanical engineering in industries and society. (04 Marks)
b. Define : i) Sensible heat ii) latent heat iii) Dry steam v) Wet steam vi) Dryness fraction. (10 Marks)
c. Find the enthalpy of 1kg of steam at 12 bar when,
i) Steam is dry saturated
ii) Steam is 22% wet
iii) Super heated to 250°C
Assume the specific heat of the super heated steam as 2.25 kJ/KgK. (06 Marks)

OR

- 2 a. Differentiate between Renewable and Non-renewable energy sources. (04 Marks)
b. With a neat sketch, explain the working principle of Hydel power plant. (08 Marks)
c. Explain with neat sketch Pelton Wheel. (08 Marks)

Module-2

- 3 a. Write a note on smart materials and shape memory alloys. (06 Marks)
b. Differentiate between ferrous and Non ferrous metals. (06 Marks)
c. What is Composite? List the applications of composite materials. (08 Marks)

OR

- 4 a. With a neat sketch, explain Arc Welding. (08 Marks)
b. Differentiate between soldering and brazing. (06 Marks)
c. Define three modes of heat transfer. (06 Marks)

Module-3

- 5 a. Differentiate between 2-stroke and 4-stroke engine. (06 Marks)
b. With neat sketch, explain working principle of 4-stroke Diesel engine. (08 Marks)
c. What are the advantages and disadvantages of electric vehicles? (06 Marks)

OR

- 6 a. Define the following :
i) Refrigeration effect
ii) Ton of Refrigeration
iii) Unit of Refrigeration
iv) Coefficient of Performance (COP)
v) Ice making capacity (10 Marks)
b. With neat sketch, explain the working of vapour compression refrigeration spectrum. (10 Marks)

Module-4

- 7 a. Explain with neat sketches,
i) Spur gear
ii) Helical gear
iii) Bevel gear (08 Marks)
b. Derive the length of the belt in open drive (08 Marks)
c. What are the advantages and disadvantages of gear drive? (04 Marks)

OR

- 8 a. Explain with neat sketch loading and unloading mechanism. (10 Marks)
b. Explain with neat sketch Robot configurations. (10 Marks)

Module-5

- 9 a. Explain with neat sketches, the following operations
i) Plain Turning
ii) Facing
iii) Taper-Turning
iv) Knurling (10 Marks)
b. With neat sketch, explain working of Horizontal Milling Machine. (10 Marks)

OR

- 10 a. Explain the components of CNC with neat block diagram. (08 Marks)
b. What are the Advantages and Disadvantages of CNC? (08 Marks)
c. Differentiate between open loop and closed loop control system. (04 Marks)

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--	--	--

18ME15/25

First/Second Semester B.E. Degree Examination, June/July 2023 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of steam tables is permitted.*

Module-1

- 1 a. Define the term fuel. Write a note on solid fuels. (06 Marks)
b. With the help of neat diagram, explain the construction and working nuclear power plant. (08 Marks)
c. Write notes on the following: (i) Ozone depletion (ii) Global warming (06 Marks)

OR

- 2 a. Define the term thermodynamics. State first and second law of thermodynamics. (06 Marks)
b. With the help of a Temperature-Enthalpy (T-h) diagram, explain the formation of steam at a constant pressure. (06 Marks)
c. 5 kg of wet steam of dryness 0.8 passes from a boiler to a super heater at a constant pressure of 1 MPa absolute. In the superheater its temperature increases to 350°C. Determine the amount of heat supplied in the superheater. The specific heat of superheated steam $C_{ps} = 2.25$ kJ/kgK. (08 Marks)

Module-2

- 3 a. Define the term boiler. Classify the boilers. (06 Marks)
b. With the help of a neat sketch, explain the construction and working of a Babcock and Wilcox boiler. Indicate clearly flow of flue gases. (10 Marks)
c. List the boiler mountings. (04 Marks)

OR

- 4 a. Define the term prime mover. Explain the principle of working of impulse and reaction turbine. (06 Marks)
b. With the help of neat sketch, explain the construction and working of Francis turbine. (08 Marks)
c. What is meant by cavitation and priming? (06 Marks)

Module-3

- 5 a. Define the term Internal Combustion Engine. Classify the Internal Combustion Engine. (06 Marks)
b. With the help of PV diagram, explain the working of four stroke diesel engine. (08 Marks)
c. Explain the desirable properties of an ideal refrigerant. (06 Marks)

OR

- 6 a. Explain the working of a vapour absorption refrigeration system with neat sketch. (07 Marks)
b. The following readings were taken on a four stroke I.C. engine:
Diameter of the brake drum = 1.5 m Diameter of the rope = 10 mm
Load suspended on the brake drum = 100 kg Spring balance reading = 5 kg
Crankshaft speed = 200 rpm
Determine the brake power of the engine. (07 Marks)
c. With the help of neat sketch, explain the working of room air conditioner. (06 Marks)

Module-4

- 7 a. What are the properties of cast iron and aluminium? (08 Marks)
 b. Differentiate between welding, brazing and soldering. (06 Marks)
 c. Write a note on smart materials. (06 Marks)

OR

- 8 a. With the help of neat sketch, explain Tungsten Inert Gas (TIG) Welding. (06 Marks)
 b. Obtain an expression for the ratio of tensions in case of flat belt. (07 Marks)
 c. List the advantages and disadvantages of gear drives over belt drives. (07 Marks)

Module-5

- 9 a. With neat sketch, highlight the specification of lathe. (06 Marks)
 b. With the help of neat sketch, explain taper turning by tailstock set over method. (06 Marks)
 c. Explain briefly, with the help of neat sketches, following operations:
 (i) Straddle milling (ii) Gang milling
 (iii) Slab milling (iv) Angular milling (08 Marks)

OR

- 10 a. Define the term Computer Numerical Control (CNC). Explain the basic components of CNC. (06 Marks)
 b. Define the term manipulator. Briefly explain the five type of joints that are used in industrial robot construction. (08 Marks)
 c. List the industrial robot application in the processing operations. (06 Marks)

USN

--	--	--	--	--	--	--	--	--	--


CITY
ENGINEERING COLLEGE

Department of Mechanical Engineering
Subject: ELEMENTS OF MECHANICAL ENGG
SEM: 2ND 'D' 'E' 'F'
Second Internal Test
Max Marks :25
Duration: 1 Hour
Date: -05/09/2023
Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART - A	M	CO'S	BT'S
1.	1. With the help of P-V diagram, explain the operation of 4-Stroke Petrol engine.	05	C01	BT1 BT2
OR				
2.	Define Electric vehicle (EV). Explain the different components of EV with a block diagram.	05	C01	BT1 BT2
PART - B				
3.	With the help of P-V diagram, explain the operation of 4-Stroke Diesel engine.	05	C01	BT2 BT3
OR				
4.	Define Hybrid Electric vehicle (HEV). Explain the different components of HEV with a block diagram.	05	C01	BT2 BT3
PART-C				
5.	Define Engineering Materials. Briefly explain the classification of Ferrous and Non Ferrous Metals	05	C02	BT2 BT3
OR				
6.	Describe the following Materials i) Ceramics ii) Shape memory Alloys	05	C02	BT2 BT3
PART-D				
7.	Describe the construction & working of Arc welding process with neat sketch	05	C01	BT2 BT3
OR				
8.	6. What is gas welding? With a neat sketch explain the principle of operation of Oxy-Acetylene Gas welding.	05	C02	BT2 BT3
PART-E				
9.	Describe the three types of carbon steels with applications	05	C01	BT2 BT3
OR				
10.	Give a brief comparison between (a) Soldering Vs Brazing	05	C01	BT2 BT3

Blooms Taxonomy Levels (BTL)
BT1- Remembering BT2- Understanding BT3 - Applying BT4 - Analysing BT5- Evaluating BT6- Creating.
Course outcomes (CO's): C01- The concepts of Role of Mechanical Engineering and Energy sources.
C02 - The Machine Tool Operations and advanced Manufacturing process.

CBCS SCHEME

USN

1 C E 2 2 C S 1 3 7

BESCK204D/BESCKD204

Second Semester B.E./B.Tech. Degree Examination, June/July 2023 Introduction to Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module - 1			M	L	C
Q.1	a.	Discuss the role of mechanical engineering in Industries and Society.	10	L2	CO1
	b.	Explain the emerging trends and technologies in following sectors: (i) Energy sector (ii) Manufacturing sector (iii) Marine sector (iv) Aerospace sector	10	L2	CO1
OR					
Q.2	a.	With a neat sketch, explain the working principle of Nuclear Power Plant.	10	L2	CO1
	b.	Explain some of the engineering applications of bio-fuels.	10	L2	CO1
Module - 2					
Q.3	a.	Explain the working principle of Lathe, drilling and milling machine.	10	L2	CO2
	b.	With a neat sketch, explain the following operations performed on lathe machine : (i) Turning (ii) Facing (iii) Knurling	10	L2	CO2
OR					
Q.4	a.	What is CNC? Explain the basic components of CNC with a neat sketch.	10	L2	CO2
	b.	List the advantages and applications of CNC.	10	L1	CO2
Module - 3					
Q.5	a.	With a neat sketch, explain the working principle of 4-stroke Petrol Engine along with PV diagram.	10	L2	CO3
	b.	With a neat sketch, list and explain the components of IC engine.	10	L2	CO3
OR					
Q.6	a.	What are electric and hybrid vehicles? List the advantages and disadvantages of EVs and hybrid vehicles.	10	L1	CO3
	b.	Explain the components of electric and hybrid vehicle with a neat sketch.	10	L2	CO3
Module - 4					
Q.7	a.	Discuss composition, properties and applications of ferrous and nonferrous metals.	10	L2	CO4
	b.	Write a note on shape memory alloys.	10	L2	CO4
OR					
Q.8	a.	Differentiate between soldering, brazing and welding.	10	L2	CO4
	b.	Explain the working principle of Arc Welding with a neat sketch.	10	L2	CO4
Module - 5					
Q.9	a.	Explain the classification of robot based on robot configuration.	10	L2	CO5
	b.	Explain the elements of automated system and list its advantages.	10	L2	CO5
OR					
Q.10	a.	Define IoT and explain the characteristics of IoT.	10	L2	CO5
	b.	Explain the physical design and protocols of IoT.	10	L2	CO5

CBCS SCHEME

USN

1	C	E	2	2	A	1	0	1	9
---	---	---	---	---	---	---	---	---	---

BESCK104D/BESCKD104

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023

Introduction to Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module - 1			M	L	C
Q.1	a.	Difference between renewable and non-renewable energy sources.	6	L2	CO1
	b.	Briefly explain the role of Mechanical Engineering in Industries and Society.	6	L2	CO1
	c.	Illustrate the operation of liquid flat plate collector and solar-photo-voltaic cells with neat sketch.	8	L2	CO1
OR					
Q.2	a.	Briefly describe the Emerging Trends and Technologies in any two sectors.	6	L2	CO1
	b.	With neat sketch, explain the working of Hydel Power Plant.	6	L2	CO1
	c.	Illustrate the operation of Wind Mill with neat sketch.	8	L2	CO1
Module - 2					
Q.3	a.	Define lathe. With neat sketch and explain the following machining operations. i) Turning ii) Facing iii) Knurling iv) Boring	10	L2	CO2
	b.	Define CNC. With block diagram, explain the different components used in CNC.	10	L2	CO2
OR					
Q.4	a.	Define milling machine. With neat sketch, explain the following machining operations: i) Drilling ii) Reaming iii) Plane-Milling iv) Slot Milling	10	L2	CO2
	b.	Write the advantages and applications of CNC.	6	L2	CO2
	c.	Define 3-D printing and classify.	4	L2	CO2
Module - 3					
Q.5	a.	With neat sketch and explain the working of 4-stroke petrol engine. And also write its P-V diagram.	10	L2	CO3
	b.	Define EV (Electric Vehicle). With block diagram, explain the different components used in EV. Also write benefits of EV in current trend.	10	L2	CO3

OR					
Q.6	a.	With neat sketch and explain the working of 4-stroke diesel engine. And also write its P-V diagram.	10	L2	CO3
	b.	Define HEV (Hybrid Electric Vehicle). With block diagram, explain the different components used in HEV. Also write limitations of EV's in current trend.	10	L2	CO3
Module – 4					
Q.7	a.	Define Engineering Material. Briefly explain the classifications of ferrous and non-ferrous metals.	10	L2	CO4
	b.	Define welding. With neat sketch, explain the working of Electric Arc Welding.	10	L2	CO4
OR					
Q.8	a.	Define the following terms: i) Ceramic ii) Graphite iii) Polymers iv) Shape Memory Alloy	10	L1	CO4
	b.	Define Soldering. With neat sketch, explain the working of Gas welding and name the different types of flames used in oxy-acetylene welding.	10	L2	CO4
Module – 5					
Q.9	a.	With a neat sketch, explain the open-loop and closed-loop mechatronic systems.	10	L2	CO5
	b.	Define Automation. Explain the classifications of automation.	10	L2	CO5
OR					
Q.10	a.	Define Industrial Robot. Explain the different configurations of Robot with neat sketch.	10	L2	CO5
	b.	Define IOT. Briefly explain the characteristics of IOT.	6	L2	CO5
	c.	Explain the logical design of IOT.	4	L2	CO5

* * * * *

USN

CITY
ENGINEERING COLLEGE
FIRST INTERNAL TEST

PROGRAMME: IS, AI & ML

COURSE NAME: INTRODUCTION TO MECHANICAL ENGG

SEM: 1ST 'A' & 'B'

Duration: 1.30 Hrs

DATE: 03/02/2023

TIME: 10:30AM - 12:00PM

MAX MARKS: 40

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.		M	CO'S	BT'S
PART - A				
1.	(a) Distinguish between conventional & non-conventional sources of energy.	04	C01	BT2
	(b) Briefly explain the emerging trends of Mechanical Engineering in Manufacturing and Energy Sector.	04		BT3
OR				
2.	Discuss the conversion of Hydel energy into supply of power transmission along with schematic diagram.	08	C01	BT2 BT3
PART - B				
3.	Explain the Construction & Working of Lathe.	08	C02	BT2 BT3
OR				
4.	Explain different machining operations performed on Lathe along with schematic sketches.	08	C02	BT2 BT3
PART-C				
5.	Explain the Construction & working of Milling m/c.	08	C02	BT2 BT3
OR				
6.	With a neat sketch explain different machining operations performed on Milling m/c.	08	C02	BT2 BT3
PART-D				
7.	Explain the working of Non-conventional source of energy conversion of desalination process to useful work along with schematic diagram.	08	C01	BT2 BT3
OR				
8.	Explain the components of CNC m/c. List the advantages & disadvantages of CNC m/c.	08	C02	BT2 BT3
PART-E				
9.	What is Solar Energy? Apply the Solar energy conversion technique into electrical energy in a solar cell.	08	C01	BT2 BT3
OR				
10.	Enumerate the method of extracting energy from Wind with a neat sketch.	08	C01	BT2 BT3

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 - Applying BT4 - Analysing BT5- Evaluating BT6- Creating.

Course outcomes (CO's): C01- The concepts of Role of Mechanical Engineering and Energy sources.

C02 - The Machine Tool Operations and advanced Manufacturing process.

CITY ENGINEERING COLLEGE
DEPARTMENT OF Mechanical Engineering

SCHEME FOR VALUATION

Semester & Section: 1st 'B'

Internal Test 01

Date: 3/2/23

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<u>PART-A:-</u>		
	(a) any 2 points b/w CES vs NCS (b) Explan of any 5 sectors in Mech. Engg	02x2=04 04x1=04	04 04 } 08.
2.	(OR)		
	Sketch Explan	04 04	08.
3.	<u>PART-B:-</u>		
	Construction of Lathe Working of Lathe	04 04	08.
4.	(OR)		
	any 2 M/c's operations on Lathe Sketch Explan	02x02=04 02x02=04	08.
5.	<u>PART-C:-</u>		
	Construction of Milling M/c Working of Milling M/c	04 04	08.
6.	(OR)		
	any 2 M/c's operations on Milling M/c - Sketch - Explan	02x02=04 02x02=04	08.
7.	<u>PART-D:-</u>		
	Sketch Explan	04 04	08.

Handwritten signature/initials

S. Karthika

USN

--	--	--	--	--	--	--	--	--	--

COURSE CODE: 22ESC144

CITY
ENGINEERING COLLEGE
SECOND INTERNAL TEST

PROGRAMME: IS, AI & ML

COURSE NAME: INTRODUCTION TO MECHANICAL ENGG

DATE: 03/03/2023

SEM: 1ST 'A' & 'B'

TIME: 10:30AM – 12:00PM

Duration: 1.30 Hrs

MAX MARKS: 40

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART - A	M	CO'S	BT'S
1.	With the help of P-V diagram, explain the working of 4-Stroke Petrol engine.	08	C03	BT2 BT3
OR				
2.	With the help of P-V diagram, explain the working of 4-Stroke Diesel engine.	08	C03	BT2 BT3
PART - B				
3.	With a neat sketch explain the process of Arc welding.	08	C03	BT2 BT3
OR				
4.	What is gas welding? With a neat sketch explain the principle of operation of Oxy-Acetylene Gas welding.	08	C03	BT2 BT3
PART-C				
5.	Discuss the need of Electric and Hybrid vehicles.	08	C03	BT2 BT3
OR				
6.	Explain IC Engine terminologies along with sketch.	08	C03	BT2 BT3
PART-D				
7.	Write the Differences between SI v/s CI engine.	08	C03	BT2 BT3
OR				
8.	List the advantages & disadvantages of Electric Vehicles & Hybrid Vehicles.	08	C03	BT2 BT3
PART-E				
9.	Enumerate the differences between Soldering, Brazing & Welding.	08	C03	BT2 BT3
OR				
10.	With the help of line diagram describe the working principle of Electric vehicle.	08	C03	BT2 BT3

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analyzing BT5- Evaluating BT6- Creating.

Course outcomes (CO's): C03: Discuss the construction and application of IC Engines, Refrigerators and Air-conditioners and analyze their performance

CITY ENGINEERING COLLEGE
DEPARTMENT OF Mechanical Engineering

SCHEME FOR VALUATION

Internal Test 02

Semester & Section: 1st 'B'

Date: 03/03/2022

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<u>PART-A:-</u> P-V diagram of 4-Stroke Petrol Engine Working	04 04	08.
2.	<u>OR</u> P-V diagram of 4-Stroke Diesel Engine Working	04 04	08.
3.	<u>PART-B:-</u> Arc welding $\left\{ \begin{array}{l} \text{Sketch} \\ \text{Explan} \end{array} \right.$	04 04	08.
4.	<u>OR</u> Defn Oxy-Acetylene gas welding $\left\{ \begin{array}{l} \text{Sketch} \\ \text{Explan} \end{array} \right.$	02 03 03	08.
5.	<u>PART-C:-</u> Need of El. vehicles & Hybrid vehicles $\left\{ \begin{array}{l} \text{Explan any } 4 \text{ points} \\ \text{Each} \end{array} \right.$	04 x 1 = 04 04 x 1 = 04	08.
6.	<u>OR</u> SI Vs CI Engine any 8 points Each.	08 x 1 = 08	08.
	<u>PART-D:-</u>		

JK
m

S. Kulkarni

USN

COURSE CODE: 22ESC144

--	--	--	--	--	--	--	--	--	--

CITY
ENGINEERING COLLEGE
THIRD INTERNAL TEST

PROGRAMME: IS, AI & ML

DATE: 06/04/2023

COURSE NAME: INTRODUCTION TO MECHANICAL ENGG

TIME: 10:30AM – 12:00PM

SEM: 1ST 'A' & 'B'

Duration: 1.30 Hrs

MAX MARKS: 40

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART – A	M	CO'S	BT'S
1.	Explain with a neat sketch the configuration of Cartesian Robot, list its advantages, disadvantages and applications.	08	C03	BT2 BT3
OR				
2.	Explain with a neat sketch the configuration of Polar Robot, list its advantages, disadvantages and applications.	08	C03	BT2 BT3
PART – B				
3.	With a Suitable Example explain the concept of open and Closed loop System.	08	C03	BT2 BT3
OR				
4.	With suitable sketches explain the different types of joints used in robots.	08	C03	BT2 BT3
PART-C				
5.	Explain the Industrial application of robots specific to (i) material handling and (ii) Assembly & inspection.	08	C03	BT2 BT3
OR				
6.	Classify ferrous & non-ferrous materials. Explain the concept of Shape memory Alloys, along with its applications.	08	C03	BT2 BT3
PART-D				
7.	With a block diagram explain the basic elements in automation system.	08	C03	BT2 BT3
OR				
8.	Explain the basic types of automation in industry.	08	C03	BT2 BT3
PART-E				
9.	With a block diagram explain the functional blocks in IOT.	08	C03	BT2 BT3
OR				
10.	With a block diagram explain any two communication models in IOT.	08	C03	BT2 BT3

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analyzing BT5- Evaluating BT6- Creating.

Course outcomes (CO's): C03: Discuss the construction and application of IC Engines, Refrigerators and Air-conditioners and analyze their performance

CITY ENGINEERING COLLEGE
DEPARTMENT OF Mechanical Engineering

SCHEME FOR VALUATION

Internal Test 02

Semester & Section: Ist 'B'

Date: 06/04/2023

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<u>PART A:-</u> Sketch Explan Advantages — ② points each Disadvantages — any ② points each Applications. — any ① point.	01 02 02x1=02 02x1=02 01	08.
2.	<u>OR</u> Sketch Explan Advantages — any ② points each Disadvantages — any ② points each Applications — any ① point.	01 02 02x1=02 02x1=02 01	08.
3.	<u>PART B:-</u> Explan of open loop sys Explan of closed loop sys.	04 04	08.
4.	<u>OR</u> Sketching — any ④ joints Explan	04x1=04 04x1=04	08.
5.	<u>PART C:-</u> Explan ← Material Handling Assembly & Inspection.	04 04	08.

[Signature]

S. Karthik

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	<p style="text-align: center;">(OR)</p> Classification Explan. Applications.	02 04 02	08.
7.	<p style="text-align: center;"><u>PART-D:-</u></p> Block diagram Explan.	04 04	08.
8.	<p style="text-align: center;">(OR)</p> Explan of any 2 types each	04 x 2 = 08	08.
9.	<p style="text-align: center;"><u>PART-E:-</u></p> Block diagram Explan	04 04	08.
10.	<p style="text-align: center;">(OR)</p> Block diagram any 2 models in FOT.	04 2 x 2 = 04	08.

Z. K. S. R.

Year : 2022 - 2023

Semester : Odd / Even ✓

Name of the Teacher : Harsha Vardhan U.

Designation : Assistant Professor

Department : Mechanical Engineering

Sem/ Branch	Subject Code	Subject
1. <u>6th A / ME</u>	<u>18ME63</u>	<u>Heat Transfer</u>
2. <u>6th A / ME</u>	<u>18ME67</u>	<u>Heat Transfer Lab</u>
3. ....	.....	.....

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	<u>PP</u>	<u>PP</u>	<u>PP</u>	<u>PP</u>
HOD	<u>S. Karthi</u>	<u>S. Karthi</u>	<u>S. Karthi</u>	<u>S. Karthi</u>
Principal				

ATTENDANCE

ASSESSMENT

Sl. No.	Reg.No.	Name	12/4	13/4	14/4	24/4	25/4	26/4	27/4	3/5	8/5	9/5	10/5	15/5	16/5	17/5	% of Attendance	Test Marks						Sessional Marks	Remarks
			1	4	2	1	4	2	4	2	1	4	2	1	2	3		T.T. (25)		A.M. (10)					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		50	50		50	30	25/40		
1	ICE20ME02	SUHAS. B.	1	2	3	4	5	6	7	8	8	9	10	11	12	12	95%	35	4	50	27	10	37		
2	ICE20ME02	ABHILASH SUVAN.	A	1	2	3	4	5	6	7	8	9	9	10	11	12	93%	30	30	50	22	10	32		
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
	No. of Abs.																								
	Initials		S	S	A	S	S	S	S	S	A	S	A	S	S	S									

Topic

Module 1 : Introduction to Mechanical Engineering

Role of Mechanical Engineering in Industries

Role of Mechanical Engineering in Society

Emerging Trends and Technologies in different sectors such as Energy, Manufacturing

Automotive, Aerospace

Marine sectors.

Introduction and applications of Energy sources like Fossil fuels

Nuclear fuels, Hydel

Solar, wind, and bio-fuels

Environmental issues like Global warming and Ozone depletion

Module 2 : Machine Tool Operations :Working Principle of lathe

Lathe operations: Turning, facing, knurling.

Working principles of Drilling Machine

drilling operations: drilling, boring, reaming.

Working of Milling Machine

Milling operations: plane milling and slot milling.

Introduction to Advanced Manufacturing Systems

Introduction, components of CNC, advantages and applications of CNC, 3D printing

Module 3 : Introduction to IC Engines: Components and Working Principles

4- Strokes Petrol Engine

4- Stroke Diesel Engine, Application of IC Engines.

Insight into Future Mobility; Electric and Hybrid Vehicles.

Components of Electric . Advantages and disadvantages of EVs

Components of Hybrid Vehicles. Advantages and disadvantages of Hybrid vehicles

Module 4 : Engineering Materials: Types and applications of Ferrous & Nonferrous Metals

Silica, Ceramics, Glass, Graphite

Diamond and polymer, Shape Memory Alloys

Joining Processes: Soldering, Brazing, Welding

Definitions, Classification of welding process, Arc welding

Gas welding and types of flames

Module 5 : Introduction to Mechatronics and Robotics: open-loop and closed-loop mechatronic systems.

Classification based on robotics configuration: polar cylindrical

Cartesian coordinate and spherical.

Application, Advantages and disadvantages.

Automation in industry: Definition, types – Fixed, programmable and flexible automation

Basic elements with block diagrams, advantages.

Introduction to IOT: Definition and Characteristics

Physical design, protocols, Logical design of IoT, Functional blocks and communication models.

Students Seminar

QUESTION BANK-2

INTRODUCTION TO MECHANICAL ENGINEERING- BESCK104D

1. With the help of P-V diagram, explain the operation of with neat sketches
 - (a) 4-Stroke Diesel engine.
 - (b) 4-Stroke Petrol engine.
2. Explain IC Engine terminologies along with sketch.
3. List the advantages & disadvantages of Electric Vehicles & Hybrid Vehicles.
4. Give a brief comparison between
 - (a) Soldering Vs Brazing
 - (b) SI Engine v/s CI Engine.
5. With a neat sketch explain the process of Arc welding.
6. What is gas welding? With a neat sketch explain the principle of operation of Oxy-Acetylene Gas welding.
7. With the help of line diagram describe the working principle of Electric vehicle.
8. Discuss the need of Electric and Hybrid vehicles.
9. Define engineering material. Briefly explain the classification of ferrous and non-ferrous metals.
10. Define the following terms i) Ceramics ii) Graphite iii) Polymers iv) Shape Memory Alloy

QUESTION BANK-1

INTRODUCTION TO MECHANICAL ENGINEERING- BESCK104D

- 1. Briefly explain the emerging trends of Mechanical Engineering in Manufacturing and Energy Sector.**
- 2. Explain the role of Mechanical Engineering in Industry and Society**
- 3. Define Energy. Distinguish between Conventional & Non-Conventional sources of energy.**
- 4. What is solar Energy? Apply the Solar energy conversion technique into electrical energy in a solar cell.**
- 5. Enumerate the method of extracting energy from Wind with a neat sketch.**
- 6. Discuss the conversion of hydel energy into supply of power transmission along with schematic diagram.**
- 7. Define Fossil fuel. Explain briefly the types of fossil fuels.**
- 8. Explain the working principle of Lathe. Explain different machining operations performed on lathe along with neat schematic sketches like facing, turning, knurling and taper turning**
- 9. Explain the working of milling m/c. with a neat sketch explain different machining operations performed on milling m/c like drilling, reaming, plane milling and slot milling**
- 10. Explain the components of CNC m/c. List the advantages & disadvantages of CNC m/c.**

Course Title:	INTRODUCTION TO MECHANICAL ENGINEERING		
Course Code:	BESCK104D/204D	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:0:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03
Course Learning Objectives			
<ul style="list-style-type: none"> To develop basic Knowledge on Mechanical Engineering, Fundamentals and Energy Sources. Understand the concept of different types of Machine tool operations and Modern Manufacturing Processes like CNC, 3D printing. To know the concept of IC engines and Future Mobility vehicles. To give exposure in the field of Engineering Materials and Manufacturing Processes Technology and its applications To acquire a basic understanding role of Mechanical Engineering in the Robotics and Automation in industry. 			
Teaching-Learning Process			
<ul style="list-style-type: none"> Adopt different types of teaching methods to develop the outcomes through PowerPoint presentations and Video demonstrations or Simulations. Arrange visits to show the live working models other than laboratory topics. Adopt collaborative (Group Learning) Learning in the class. Adopt Problem Based Learning (PBL), which fosters students Analytical skills and develops thinking skills such as evaluating, generalizing, and analyzing information. 			
Module-1 (8 hours)			
Introduction: Role of Mechanical Engineering in Industries and Society- Emerging Trends and Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors.			
Energy: Introduction and applications of Energy sources like Fossil fuels, Nuclear fuels, Hydel, Solar, wind, and bio-fuels, Environmental issues like Global warming and Ozone depletion			
Module-2 (8 hours)			
Machine Tool Operations:			
Working Principle of lathe, Lathe operations: Turning, facing, knurling. Working principles of Drilling Machine, drilling operations: drilling, boring, reaming. Working of Milling Machine, Milling operations: plane milling and slot milling.			
(No sketches of machine tools, sketches to be used only for explaining the operations).			
Introduction to Advanced Manufacturing Systems: Introduction, components of CNC, advantages and applications of CNC, 3D printing.			
Module-3 (8 hours)			
Introduction to IC Engines: Components and Working Principles, 4-Stroke Petrol and Diesel Engines, Application of IC Engines.			
Insight into Future Mobility; Electric and Hybrid Vehicles, Components of Electric and Hybrid Vehicles. Advantages and disadvantages of EVs and Hybrid vehicles.			
Module-4 (8 hours)			
Engineering Materials: Types and applications of Ferrous & Nonferrous Metals, silica, ceramics, glass, graphite, diamond and polymer. Shape Memory Alloys.			
Joining Processes: Soldering, Brazing and Welding, Definitions, classification of welding process, Arc welding, Gas welding and types of flames.			
Module-5 (8 hours)			

Introduction to Mechatronics and Robotics: open-loop and closed-loop mechatronic systems. Classification based on robotics configuration: polar cylindrical, Cartesian coordinate and spherical. Application, Advantages and disadvantages.
Automation in industry: Definition, types – Fixed, programmable and flexible automation, basic elements with block diagrams, advantages.
Introduction to IOT: Definition and Characteristics, Physical design, protocols, Logical design of IoT, Functional blocks, and communication models.

Course Outcome (Course Skill Set)

At the end of the course the student will be able to:

C01	Explain the concepts of Role of Mechanical Engineering and Energy sources.
C02	Describe the Machine Tool Operations and advanced Manufacturing process.
C03	Explain the Working Principle of IC engines and EV vehicles.
C04	Discuss the Properties of Common Engineering Materials and various Metal Joining Processes.
C05	Explain the Concepts of Mechatronics, Robotics and Automation in IoT

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation(CIE):

Three Tests each of **20 Marks**;

- 1st, 2nd, and 3rd tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- Assignments/Seminar/quiz/group discussion /field survey & report presentation/ course project/Skill development activities, suitably planned to attain the COs and POs for a total of **40 Marks**.

If the nature of the courses requires assignments/Seminars/Quizzes/group discussion two evaluation components shall be conducted. If course project/field survey/skill development activities etc then the evaluation method shall be one.

Total CIE marks (out of 100 marks) shall be scaled down to **50 marks**

Semester End Examination(SEE):

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

Suggested Learning Resources:**Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)****Text Books:**

1. Elements of Mechanical Engineering, K R Gopala Krishna, Subhash Publications, 2008
2. An Introduction to Mechanical Engineering, Jonathan Wickert and Kemper Lewis, Third Edition, 2012

Reference Books:

1. Elements of Workshop Technology (Vol. 1 and 2), Hazra Choudhry and Nirzar Roy, Media Promoters and Publishers Pvt. Ltd., 2010.
2. Manufacturing Technology- Foundry, Forming and Welding, P.N.Rao Tata McGraw Hill 3rdEd., 2003.
3. Internal Combustion Engines, V. Ganesan, Tata McGraw Hill Education; 4th edition, 2017
4. Robotics, Appu Kuttan KK K. International Pvt Ltd, volume 1
5. Dr SRN Reddy, Rachit Thukral and Manasi Mishra, " Introduction to Internet of Things: A Practical Approach", ETI Labs
6. Raj kamal, " Internet of Things: Architecture and Design", McGraw hill.

Web links and Video Lectures (e-Resources):

- <https://rakhoh.com/en/applications-and-advantages-of-steam-in-manufacturing-and-process-industry/>
- [Videos | Makino \(For Machine Tool Operation\)](#)

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Demonstration of lathe/milling/drilling operations
- Demonstration of working of IC Engine.
- Study arc welding, oxy-acetylene gas flame structure.
- Video demonstration of latest trends in mobility robotics and Automation
- Demonstration of developing models on machine tools

COs and POs Mapping (CO-PO mappings are only Indicative)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C01	3					1	2			1		1
C02	3					1	1			1		1
C03	3					1	1			1		1
C04	3					1	1			1		1
C05	3					1	1			1		1

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

CIRCULAR

Ref No: CEC/ME/DAC/ACY 2022-2023/02

Date: 08-02-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 08-02-2023 at 10: 00 AM in ME department.

Agenda:

- Planning of Internships, Project work & Technical Seminar for 8th semester students.
- Involving students in technical activities.
- Planning of AICTE activity report for 8th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning of Course preference, Course allocation & Work load distribution for upcoming even semester.

S Karunakara

Dr.S.Karunakara

HOD

DEPARTMENT OF MECHANICAL ENGINEERING

Department Advisory Committee Meeting

Date: 16/09/2022

Time: 10:00 AM

Venue: ME Department

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Dr. S Karunakara	HOD	Convenor
2	Dr. Uma T R	Professor	Member
3	Mr. Mathenulla Shariff	Professor	Co-Convenor
4	Harsha Vardhan U	Assistant Professor	Member
5	Anil Kumar R	Assistant Professor	Member
6	Shruti Naik	Assistant Professor	Member
7	Vijay Kumar	Assistant Professor	Member
8	Sampath H P	Assistant Professor	Member
9	Rakesh Y D	Assistant Professor	Member
10	Shivaraja H B	Assistant Professor	Member
11	Bharath P T	Assistant Professor	Member
12	Shashank	Consultant	Alumni

The Department Advisory Committee meeting was conducted at Department of ME, on 8th February, 2023, at 10 AM.

Agenda of the Meeting:

- Planning of Internships, Project work & Technical Seminar for 8th semester students.
- Involving students in technical activities.
- Planning of AICTE activity report for 8th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning of Course preference, Course allocation & Work load distribution for upcoming even semester.

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The HOD welcomed all the staff for the meeting. The following points were discussed as follows.

- Committee members suggested establishing MOUs with various Construction & Building valuation industries to provide students with internship & project work opportunities.
- It was proposed to conduct a workshop, seminars & guest lecture on recent trending topics.
- The staff members were informed to conduct classes and labs regularly, to timely conduct and complete the entrusted responsibility, to actively participate in the dept and college activities and finally to take suitable actions for getting results and admissions to the dept.
- The guide has to check and discuss about the internship practice taken by students allocated to him or she.
- The staff members should complete all the five modules and work hard to get 100% pass percentage. The staff members should find out the reasons for poor percentage in the concerned subject and submit report.

HOD thanked all the staff for having attended the meeting.

S Karunakara

Dr.S.Karunakara

HOD



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23(EVEN)

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/	Signature
			Semester	
1	Dr. S Karunakara	21ME65B, BCEDK203	VI, II	
2	Dr. Uma T R	18ME652, 18ME82	VI, VIII	
3	Mr. Mathenulla Shariff	18ME43, BCSCCK204D	IV, II	
4	Harsha Vardhan U	18ME61, 18ME41	VI, IV	
5	Anil Kumar R	18ME81, BCEDK203	VIII, II	
6	Shruti Naik	18ME42, BCEDK203	IV, II	
7	Vijay Kumar	18ME61, BCSCCK204D	VI, II	
8	Sampath H P	18ME62, 18ME43	VI, IV	
9	Rakesh Y D	18ME42, BCSCCK204D	IV, II	
10	Shivaraja H B	18ME62, 18ME81	VI, VIII	
11	Bharath P T	18ME42, 18ME83	IV, VIII	

HOD



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23 (Even)

Department of Mechanical Engineering

COURSE PREFERENCE

Name of the Faculty: Harsha Vardhan. U

Designation: Assistant professor.

Sl. No	Course Code and Name	Year/Semester
1	18ME63/HT	III / VI
2.	BCSEK204D/Introduction to Mechanical Engineering	II / III
3.	BCEDK203/CAED	II / III

Signature of Faculty



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (Odd SEM)& Even SEM, Department of Mechanical Engineering

Feb 2023

March2023

April2023

May2023

DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
WED	1	1st Sem –I CIE	1	1st Sem –II CIE				
THU	2		2					
FRI	3		3					
SAT	4		4		1	III SEM LAST WORKING DAY III test DIP		
SUN	5		5		2			
MON	6		6	I test -DIP	3	III test DIP & II test -8thsem 1st sem practical exam	1	KARMIKARA DINACHARANE
TUE	7		7	I test-DIP	4	3 rd sem practical exam	2	
WED	8		8	Women's day	5		3	
THU	9	5 th sem practical ends	9		6		4	
FRI	10	Talents day	10		7	GOOD FRIDAY	5	
SAT	11	2 nd Saturday holiday	11	2 nd Saturday holiday	8	2 nd Saturday holiday	6	2 nd Saturday holiday
SUN	12		12		9		7	
MON	13	8 th sem commencement	13	I test 8 th Sem	10		8	III test-8 th sem
TUE	14		14		11		9	
WED	15		15	3 rd sem-III CIE &II test	12		10	
THU	16	5 th sem theory exam starts	16	3 rd sem-III CIE &II test	13		11	
FRI	17		17	3 rd sem-III CIE &II test	14	Dr. B. R. AMBEDKAR JAYANTI	12	
SAT	18	MAHA SHIVARATHRI	18	5 th sem theory exam ends	15		13	
SUN	19		19		16		14	
MON	20		20	6 th semester commencement	17	I st & 3rd sem theory Examination	15	Commencement of II/IV SEM
TUE	21		21		18		16	
WED	22		22	CHANDRAMANA UGADI	19		17	
THU	23		23		20		18	
FRI	24		24		21		19	
SAT	25	4 th Saturday holiday	25	4 th Saturday holiday	22	Alumni day	20	4 th Saturday holiday
SUN	26		26		23		21	
MON	27		27	1st sem –III CIE	24		22	
TUE	28		28		25		23	
WED			29		26		24	
THU			30		27		25	
FRI			31		I SEM LAST WORKING DAY- COLLEGE DAY	28		26
SAT					29		27	
SUN					30		28	
MON							29	
TUE							30	
WED							31	

Skandan

CITY ENGINEERING COLLEGE
(Doddakallsandra, Off Kanakapura Road, Bangalore-560061)
Department of Mechanical Engineering



Faculty Academic File

NAME: HARSHA VARDHAN U.

DESIGNATION: ASSISTANT PROFESSOR

SEMESTER: 06

SECTION: 'A'

SUBJECT NAME & CODE: HT & 18ME63

ACADEMIC YEAR: 2022-2023

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING
Individual Time Table 2022-2023 TIME TABLE

Faculty: Harsha Vardhan U

DAY	1	2	TEA	3	4	LUNCH	5	6	7	
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM	
MON	18ME63		B R E A K		21ME43	L U N C H				
TUE	21ME43				18ME63					
WED		18ME63			21ME43					
THU					21ME43		18ME63			
FRI		18ME63					21ME43			
SAT										

S. Kulkarni

HEAD OF THE DEPARTMENT
Mechanical Engineering
CITY ENGINEERING COLLEGE
Doddakallasandra, Kanakapura Main Road
BANGALORE - 560 061
HOD, Dept. of ME



VISVESVARAYA TECHNOLOGICAL UNIVERSITY
CITY ENGINEERING COLLEGE
DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Name of the staff: **HARSHA VARDHAN U**

Dept: **Mechanical Engineering**

Class: **6th sem**

Subject: **Heat Transfer (18ME63)**

Sl.No.	Date	Topics to be covered
1.	17/4/23	Module 1: Introductory concepts and definitions: Modes of heat transfer: Basic laws governing conduction, convection, and radiation heat transfer;
2.	18/4/23	Types of boundary conditions. General three dimensional Heat Conduction Equation: Derivation of the equation in (i) Cartesian, coordinate only.
3.	19/4/23	Discussion of three dimensional Heat Conduction Equation in (ii) Polar and (iii) Spherical Co-ordinate Systems.
4.	24/4/23	Steady-state one-dimensional heat conduction problems in Cartesian System: Steady-state one-dimensional heat conduction problems (i) without heat generation and (ii) constant thermal conductivity - in Cartesian system with various possible boundary conditions.
5.	25/4/23	Brief Introduction to variable thermal conductivity and heat generation [No numerical on variable thermal conductivity and heat generation] Thermal Resistances in Series and in Parallel.
6.	26/4/23	Critical Thickness of Insulation in cylinder and spheres Concept. Derivation
7.	02/5/23	Numerical problems
8.	03/5/23	Numerical problems
9.	08/5/23	Module-2, Extended Surfaces or Fins: Classification, Straight
10.	09/5/23	Rectangular and Circular Fins
11.	10/5/23	Temperature Distribution and Heat Transfer Calculations,
12.	15/5/23	Fin Efficiency and Effectiveness, Applications
13.	16/5/23	Transient [Unsteady-state] heat conduction: Definition, Different cases - Negligible internal thermal resistance, negligible surface resistance,
14.	17/5/23	comparable internal thermal and surface resistance, Lumped body
15.	23/5/23	Infinite Body and Semi-infinite Body,
16.	24/5/23	Numerical Problems, Heisler and Grober charts.
17.	29/5/23	Module 3: Numerical Analysis of Heat Conduction: Introduction, one-dimensional steady conduction
18.	30/5/23	One dimensional unsteady conduction,
19.	5/6/23	boundary conditions, solution methods.
20.	6/6/23	Thermal Radiation: Fundamental principles - Gray, White, Opaque, Transparent and Black bodies, Spectral emissive power,
21.	7/6/23	Wien's displacement law, Planck's laws, Hemispherical Emissive Power,
22.	12/6/23	Stefan-Boltzmann law for the total emissive power of a black body, Emissivity and Kirchhoff's Laws,
23.	13/6/23	View factor, Net radiation exchange between parallel plates,
24.	14/6/23	concentric cylinders, and concentric spheres, Radiation Shield.
25.	15/6/23	Module 4: Forced Convection: Boundary Layer Theory, Velocity and Thermal Boundary Layers, Prandtl number,
26.	16/6/23	Turbulent flow, Various empirical solutions, Forced convection flow over cylinders and spheres,

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING
EVEN 2022-2023 TIME TABLE

CLASS ROOM:A306

W.E.F : 05-06-2023

SEMESTER: IV ME 'A'

DAY	1	2	TEA	3	4	LUNCH	5	6	7	
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM	
MON	21MAT41	21ME45	B R E A K	21ME42	21ME43	L U N C H	21MEL46			
TUE	21ME43	21ME42		21MAT41	21ME44		tutorials			
WED	21MAT41	21ME45		21ME44	21ME43		21ME48X			
THU	21ME42	21ME45		21ME43	tutorials		Tutorials			
FRI	21ME44	21MAT41		21ME42	tutorials		Tutorials			
SAT	INTERSHIP PRESENTATION			NSS/SPORTS						

S. Karhana

HEAD OF THE DEPARTMENT
Mechanical Engineering
CITY ENGINEERING COLLEGE
Doddakallasandra, Kanakapura Main Road
BANGALORE - 560 061
HOD, Dept. of ME

Pr. Swamy

PRINCIPAL
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING
EVEN 2022-2023 TIME TABLE

SEMESTER: VI ME 'A'

CLASS ROOM:A305

W.E.F : 20-03-2023

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	18ME63	18ME641	B R E A K	18ME61	18ME62	L U N C H	18MEL66		
TUE	18ME61	18ME641		18ME62	18ME63		18MEL67		
WED	18ME62	18ME63		18ME62	18ME61				
THU	18ME653	18ME61		18ME653	18ME63				
FRI	18ME653	18ME61		18ME641	18ME63				
SAT									

S. Kanhan

HEAD OF THE DEPARTMENT
Mechanical Engineering
CITY ENGINEERING COLLEGE
Doddakallas, HOD, Dept. of ME, Main Road
BANGALORE - 560 051

Pr. Swamy

PRINCIPAL
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 051

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING
EVEN 2022-2023 TIME TABLE

SEMESTER: VIII ME 'A'

CLASS ROOM:304

W.E.F : 13-02-2023

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	18ME824	18ME81	B R E A K	18ME824	TUT	L U N C H	18MES84		
TUE	18ME81	18ME81		18ME824	TUT		18MEI85		
WED	18MEP83			18MEP83			18MEP83		
THU									
FRI									
SAT									

S. Kulkarni

HEAD OF THE DEPARTMENT
Mechanical Engineering
CITY ENGINEERING COLLEGE
HOD, Dept. of ME
Doddakallasandra, Kanakapura Main Road
BANGALORE - 560 061



PRINCIPAL
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE		
DEPARTMENT OF MECHANICAL ENGINEERING		
HEAT TRANSFER - 18ME63		
SL NO.	USN	STUDENT NAME
1	1CE20ME001	SUHAS B
2	1CE20ME002	ABHILASH SUVAN



S. Kulkarni

B. E. MECHANICAL ENGINEERING Choice Based Credit System (CBCS) and Outcome Based Education (OBE) SEMESTER - VI HEAT TRANSFER			
Course Code	18ME63	CIE Marks	40
Teaching Hours /Week (L:T:P)	3:2:0	SEE Marks	60
Credits	04	Exam Hours	03
Course Learning Objectives: <ul style="list-style-type: none"> • Study the modes of heat transfer. • Learn how to formulate and solve 1-D steady and unsteady heat conduction problems. • Apply empirical correlations for fully-developed laminar, turbulent internal flows and external boundary layer convective flow problems. • Study the basic principles of heat exchanger analysis and thermal design. • Understand the principles of boiling and condensation including radiation heat transfer related engineering problems. 			
Module-1			
Introductory concepts and definitions: Modes of heat transfer: Basic laws governing conduction, convection, and radiation heat transfer; Types of boundary conditions. General three dimensional Heat Conduction Equation: Derivation of the equation in (i) Cartesian, coordinate only. Discussion of three dimensional Heat Conduction Equation in (ii) Polar and (iii) Spherical Co-ordinate Systems.			
Steady-state one-dimensional heat conduction problems in Cartesian System: Steady-state one-dimensional heat conduction problems (i) without heat generation and (ii) constant thermal conductivity - in Cartesian system with various possible boundary conditions. Brief Introduction to variable thermal conductivity and heat generation [No numerical on variable thermal conductivity and heat generation] Thermal Resistances in Series and in Parallel. Critical Thickness of Insulation in cylinder and spheres Concept. Derivation			
Module-2			
Extended Surfaces or Fins: Classification, Straight Rectangular and Circular Fins, Temperature Distribution and Heat Transfer Calculations, Fin Efficiency and Effectiveness, Applications			
Transient [Unsteady-state] heat conduction: Definition, Different cases - Negligible internal thermal resistance, negligible surface resistance, comparable internal thermal and surface resistance, Lumped body, Infinite Body and Semi-infinite Body, Numerical Problems, Heisler and Grober charts.			
Module-3			
Numerical Analysis of Heat Conduction: Introduction, one-dimensional steady conduction and one dimensional unsteady conduction, boundary conditions, solution methods.			
Thermal Radiation: Fundamental principles - Gray, White, Opaque, Transparent and Black bodies, Spectral emissive power, Wien's displacement law, Planck's laws, Hemispherical Emissive Power, Stefan-Boltzmann law for the total emissive power of a black body, Emissivity and Kirchhoff's Laws, View factor, Net radiation exchange between parallel plates, concentric cylinders, and concentric spheres, Radiation Shield.			
Module-4			
Forced Convection: Boundary Layer Theory, Velocity and Thermal Boundary Layers, Prandtl number, Turbulent flow, Various empirical solutions, Forced convection flow over cylinders and spheres, Internal flows –laminar and turbulent flow solutions.			
Free convection: Laminar and Turbulent flows, Vertical Plates, Vertical Tubes and Horizontal Tubes, Empirical solutions.			
Module-5			

Heat Exchangers: Definition, Classification, applications, LMTD method, Effectiveness - NTU method, Analytical Methods, Fouling Factors, Chart Solution Procedures for solving Heat Exchanger problems: Correction Factor Charts and Effectiveness-NTU Charts.

Introduction to boiling: pool boiling, Bubble Growth Mechanisms, Nucleate Pool Boiling, Critical Heat Flux in Nucleate Pool Boiling, Pool Film Boiling, Critical Heat Flux, Heat Transfer beyond the Critical Point, filmwise and dropwise Condensation.

Course Outcomes: At the end of the course, the student will be able to:

CO1: Understand the modes of heat transfer and apply the basic laws to formulate engineering systems.

CO2: Understand and apply the basic laws of heat transfer to extended surface, composite material and unsteady state heat transfer problems.

CO3: Analyze heat conduction through numerical methods and apply the fundamental principle to solve radiation heat transfer problems.

CO4: Analyze heat transfer due to free and forced convective heat transfer.

CO5: Understand the design and performance analysis of heat exchangers and their practical applications, Condensation and Boiling phenomena.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub- questions) from each module.
- Each full question will have sub- question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Principals of heat transfer	Frank Kreith, Raj M. Manglik, Mark S. Bohn	Cengage learning	Seventh Edition 2011.
2	Heat transfer, a practical approach	Yunus A. Cengel	Tata Mc Graw Hill	Fifth edition
Reference Books				
1	Heat and mass transfer	Kurt C, Rolle	Cengage learning	second edition
2	Heat Transfer A Basic Approach	M. Necati Ozisik	McGraw Hill, New York	2005
3	Fundamentals of Heat and Mass Transfer	Incropera, F. P. and De Witt, D. P	John Wiley and Sons, New York	5th Edition 2006
4	Heat Transfer	Holman, J. P.	Tata McGraw Hill, New York	9th Edition 2008

S. K. Kulkarni

USN

--	--	--	--	--	--	--	--	--	--

COURSE CODE: 18ME63

CITY
ENGINEERING COLLEGE
FIRST INTERNAL TEST

PROGRAMME: MECHANICAL ENGINEERING
COURSE NAME: HEAT TRANSFER
SEM: 6TH 'A'

DATE: 03/05/2023
TIME: 10:30AM – 12:00PM

Duration: 1.30 Hrs

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART - A	M	CO'S	BT'S
1.	Define with appropriate expressions: (i) Heat Flux (ii) Thermal Conductivity (iii) Thermal Diffusivity (iv) HTC (v) Thermal Contact Resistance.	10	C01 C02	BT1 BT2
OR				
2.	Briefly narrate the modes of heat transfer & explain the laws governing them.	10	C01 C02	BT1 BT2
PART - B				
3.	Derive a general expression for 3-D heat conduction equation in Cartesian co-ordinates for isotropic material.	10	C01 C02	BT1 BT2
OR				
4.	Derive a general expression for 1-D heat conduction equation in Cartesian co-ordinates for isotropic material.	10	C01 C02	BT1 BT2
PART-C				
5.	Briefly describe the boundary conditions of I, II & III kinds.	10	C01 C02	BT1 BT2
OR				
6.	A furnace wall is made up of three layers of thickness 250mm, 100mm & 150mm with thermal conductivities of 1.65, k & 9.2 W/m ⁰ C respectively. The inside is exposed to gases at 1250 ⁰ C with a convection co-efficient of 25W/m ² ⁰ C & the inside surface is at 1100 ⁰ C, the outside surface is exposed to air at 25 ⁰ C with convection coefficient of 12W/m ² ⁰ C. Determine: (i) The unknown thermal conductivity 'k' (ii) The overall HTC (iii) All surface temperatures.	10	C01 C02	BT2 BT2
PART-D				
7.	A standard cast iron pipe (inner diameter = 50mm & outer diameter = 55mm) is insulated with 85% magnesium insulation (k=0.02 W/m ⁰ C). Temperature at the interface between the pipe & insulation is 300 ⁰ C. The allowable heat loss through the pipe is 600W/m length of pipe & for the safety, the temperature of the outside surface of insulation must not exceed 100 ⁰ C. Determine : (i) Minimum thickness of insulation required, and (ii) The temperature of inside surface of the pipe assuming its thermal conductivity 20 W/m ⁰ C.	10	C01 C02	BT3
OR				

8.	A furnace wall is composed of 220mm of fire brick, 150mm of common brick, 50mm of 85% magnesia & 3mm of steel plate on the outside. If the inside surface temperature is 1500°C & outside surface temperature is 90°C, estimate the temperatures between layers & calculate the heat loss in kJ/h-m ² C. Assume, k (for fire brick) =4 kJ/m-h ⁰ C, k (for common brick) =2.8 kJ/m-h ⁰ C, k (for 85% magnesia) =0.24 kJ/m-h ⁰ C, k (for steel) =240 kJ/m-h ⁰ C.	10	C01 C02	BT1 BT2
PART-E				
9.	Derive a general expression for 1-D heat conduction equation in Cylindrical co-ordinates & mention their assumptions.	10	C01 C02	BT3 BT4
OR				
10.	A 240mm steam main, 210 meters long is covered with 50mm of high temperature insulation (k=0.092 W/m ⁰ C) & 40mm of low temperature insulation (k=0.062 W/m ⁰ C). The inner & outer surface temperatures as measured are 390°C & 40°C respectively. Calculate: (i) The total heat loss per hour. (ii) The heat loss per m ² of pipe surface. (iii) The total heat loss per m ² of outer surface & (iv) The temperature between two layers of insulation. Neglect heat conduction through pipe material.	10	C01 C02	BT3 BT4

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analyzing BT5- Evaluating BT6- Creating.

Course outcomes (CO's)

C01: Understand the basic modes of heat transfer.

C02: Compute the temperature distribution in steady-state & unsteady-state Conduction.

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	$Q = 1225 \text{ W}$ $K = 2.817 \text{ W/m}^\circ\text{C}$ $U = 3.06 \text{ W/m}^2\text{ }^\circ\text{C}$ $t_2 = 531.8^\circ\text{C}$ $t_3 = 398^\circ\text{C}$ $t_4 = 337.5^\circ\text{C}$ Sketch — 01	$6+3+1=10$	10.
7.	<p style="text-align: center;"><u>PART-D:-</u></p> $Q/L = 600 \text{ W/m}$ $r_3 = 0.0287 \text{ m}$ $t_1 = 300.45^\circ\text{C}$ Sketch Data <div style="text-align: center;">(OR)</div>	02 03 03 01 01	10.
8.	Sketch data $t_1 = 200^\circ\text{C}$ $t_L = 90^\circ\text{C}$ $t_3 = 25^\circ\text{C}$ Substn	01 01 $02 \times 3 = 06$ 02	10.
9.	<p style="text-align: center;"><u>PART-E:-</u></p> 1-D cylindrical Eqn. $\frac{1}{r} \cdot \frac{\partial}{\partial r} \left(r \cdot \frac{\partial T}{\partial r} \right) + \frac{1}{r^2} \cdot \frac{\partial^2 T}{\partial \theta^2} = \frac{1}{\alpha} \cdot \frac{\partial T}{\partial t}$ Sketch derivation <div style="text-align: center;">(OR)</div>	02 02 06	10.
10.	Sketch Data $Q = 231029.6 \text{ KJ/hr.}$ $Q/A = 1459. \text{ KJ/hr.}$ $\text{outg } Q = 834.03 \text{ KJ/hr.}$ $t_L = 205.8^\circ\text{C}$ <u>ansd wad. 2</u>	01 01 02 02 02 02	10.

USN

--	--	--	--	--	--	--	--	--	--

COURSE CODE: 18ME63

CITY
ENGINEERING COLLEGE
SECOND INTERNAL TEST

PROGRAMME: MECHANICAL ENGINEERING

DATE: 09/06/2023

COURSE NAME: HEAT TRANSFER

TIME: 10:30am – 12:00 pm

SEM: 6TH 'A'

Duration: 1.30 Hrs

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART - A	M	CO'S	BT'S
1.	Derive an expression for the temperature distribution for a long pin of uniform cross section without insulated tip.	10	C02 C03	BT1 BT2
OR				
2.	Explain physical significance of Biot number and Fourier number.	04	C03	BT1 BT2
	Obtain an expression for instantaneous heat transfer and total heat transfer for lumped heat analysis treatment of heat conduction problem.	06		BT1 BT2
PART - B				
3.	Define Hydrodynamic and Thermal boundary layer in case of flow over a flat plate.	05	C04	BT1 BT2
	Explain the physical significance of the following: (a) Reynolds number (b) Nusselt number (c) Prandtl number (d) Grashoff number (e) Stanton number.	05		BT1 BT2
OR				
4.	With the help of dimensional analysis, derive expression for the Reynolds number, Prandtl number and Nusselt number.	10	C04	BT1 BT2
PART-C				
5.	Define critical thickness of insulation and explain physical significance of critical thickness of insulation? Derive an expression for critical thickness of insulation for a cylinder.	10	C02 C03	BT1 BT2
OR				
6.	Define (i) Fin Efficiency (ii) Fin Effectiveness.	04	C03	
	Superheated steam at 330 ⁰ C is flowing at 20m/s velocity ($h=110 \text{ W/m}^{20}\text{C}$) through a pipe 120mm in diameter. The temperature of steam is to be measured by putting a pocket in the pipe of 15mm diameter (inside) and 1mm wall thickness. The thermal conductivity of the material of the pocket is 50 W/m ⁰ C. (i) Determine the length of insertion so that thermometric error is 0.5%. Find also the temperature measured if the pipe wall temperature is 40 ⁰ C. (ii) What will be the actual error in temperature measurement in ⁰ C if	06	C03	BT3 BT4 BT5

	the depth of immersion is 55mm only and the pipe wall temperature is 40°C?			
PART-D				
7.	A rod ($K=200 \text{ W/mK}$) 10mm in diameter and 5cm long has its one end maintained at 100°C. The surface of the rod is exposed to ambient air at 30°C with convective heat transfer co-efficient of 100 $\text{W/m}^2\text{K}$. Assuming other end insulated, determine (i) The temperature of the rod at 25 mm distance from the end at 100°C. (ii) Heat dissipation rate from the surface of the rod. (iii) Effectiveness.	06	C03	BT3 BT4 BT5
	With a neat sketch explain the error estimation in temperature measurement.	04	C02 C03	BT2
OR				
8.	Derive an expression for temperature distribution and heat dissipation in a straight fin of a rectangular profile for the fin insulated at the tip.	10	C03	BT1 BT3
PART-E				
9.	A 15mm diameter mild steel sphere ($K=42 \text{ W/m}^0\text{C}$) is exposed to cooling airflow at 20°C resulting in the convective coefficient $h=120 \text{ W/m}^2\text{C}$. Determine the following: (i) Time required to cool the sphere from 550°C to 90°C. (ii) Instantaneous heat transfer rate 2min after the start of cooling. (iii) Total energy transferred from the sphere during the first 2min. For mild steel take: $\rho=7850\text{kg/m}^3$, $C=475 \text{ J/kg}^0\text{C}$ & $\alpha=0.045 \text{ m}^2/\text{h}$.	10	C03	BT3 BT4 BT5
OR				
10.	An aluminium alloy plate of 400mm*400mm*4mm size at 200°C is suddenly quenched into liquid oxygen at -183°C. Starting from fundamentals or deriving the necessary expression, determine the time required for the plate to reach a temperature of -70°C. Assume $h=20000 \text{ kJ/m}^2\text{-h}^0\text{C}$, $C_p=0.8\text{kJ/kg}^0\text{C}$ & $\rho=3000\text{kg/m}^3$.	05	C03	BT3 BT4 BT5
	A Steel ball 100mm in diameter and initially at 900°C is placed in air at 30°C. Find: (i) Temperature of the ball after 30 sec. (ii) The rate of cooling ($^0\text{C}/\text{min}$) after 30 sec. Take $h= 20 \text{ W/m}^2\text{C}$, $k \text{ (steel)} = 40 \text{ W/m}^0\text{C}$, $\rho_{\text{steel}}=7800\text{kg/m}^3$, $C=460 \text{ J/kg}^0\text{C}$.	05	C03	BT3 BT4 BT5

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analyzing BT5- Evaluating
BT6- Creating.

Course outcomes (CO's)

CO2: Compute temperature distribution in steady-state and unsteady-state heat conduction.
CO3: Understand and interpret heat transfer through extended surfaces.
CO4: Interpret and compute Forced and Free Convective heat transfer.

CITY ENGINEERING COLLEGE
DEPARTMENT OF Mechanical Engineering

SCHEME FOR VALUATION

Semester & Section: 6th 'A' Internal Test 02

Date: 01/06/2023

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<p style="text-align: center;"><u>PART-A:-</u></p> <p>Sketch derivation</p> $\frac{\cosh m(L-x) + (h/mk) \sinh m(L-x)}{\cosh mL + (h/mk) \cdot \sinh mL}$ <p style="text-align: center;">(OR)</p>	01 07 02	10.
2.	<p>(a). Biot <u>no</u> Fouier <u>no</u></p> <p>(b). Instantaneous Q.T, $Q_i = -hAs (t_i - t_a) e^{-Bi \cdot Fo}$</p> <p>Total H.T.R, $Q' = SVC (t_i - t_a) [e^{-Bi \cdot Fo} - 1]$</p> <p style="text-align: center;"><u>PART-B:-</u></p>	02 } 04 03 } 06 03 } 06	10.
3.	<p>(a) Defn of each layer</p> <p>(b) sign of each non-dimensional <u>no</u></p> <p style="text-align: center;">(OR)</p>	2 1/2 x 2 = 05 01 x 5 = 05	10.
4.	$\pi_1 = \frac{u}{SDV}$ $\pi_2 = \frac{CpSDV}{k}$ $\pi_3 = \frac{k}{hD}$ <p>$Re = C(Re)^m \cdot (Pr)^m$</p> <p style="text-align: center;"><u>PART-C:-</u></p>	03 x 3 = 09 01	10.
5.	<p>Defn Expi. of phy. sign Sketch + derivation</p>	01 01 02+06	10.



S. Karanas

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	<p style="text-align: center;">(OR)</p> <p>(a). Each Defn along Eqn. (b). $m = 48.35$ $L = 124 \text{ mm}$ $t_1 = 328.55^\circ\text{C}$ $(t_1 - t_f) = -43.7^\circ\text{C}$</p>	$02 \times 2 = 04$ 01 01 02 } 06 02	10.
7.	<p style="text-align: center;"><u>PART-D:-</u></p> <p>(a). $T = 650^\circ\text{C}$ $\rho = 25.2 \text{ W/m}^2$ $\eta = 39.4 = 40\%$</p> <p>(b). Sketch Expln</p>	02 02 } 06 02 02 } 04 02	10.
8.	<p style="text-align: center;">(OR)</p> <p>Sketch derivation $\frac{\cosh m(L-x)}{\cosh(mL)}$</p>	01 07 02	10.
9.	<p style="text-align: center;"><u>PART-E:-</u></p> <p>Data $T = 26^\circ\text{sec}$ $\rho' = 32.6 \text{ W/m}^2$ $Q = 48 \text{ kW}$ Substitution</p>	02 02 02 02 02	10.
10.	<p style="text-align: center;">(OR)</p> <p>(a). $A_s = 0.32 \text{ m}^2$, $N = 0.00064 \text{ m}^2$ $L_c = 0.002 \text{ m}$, $Bi = 0.0519$ $T = 1.0545$</p> <p>(b). $L_c = 0.01667 \text{ m}$, $Bi = 0.00335$ $t = 891.3^\circ\text{C}$ $\frac{dt}{dt} = 217.23^\circ\text{C/min}$</p>	01 02 } 05 02 02 } 05 01 02	10.

USN

--	--	--	--	--	--	--	--	--	--

COURSE CODE: 18ME63

CITY
ENGINEERING COLLEGE
THIRD INTERNAL TEST

PROGRAMME: MECHANICAL ENGINEERING
COURSE NAME: HEAT TRANSFER
SEM: 6TH 'A'

DATE: 13/07/2022
TIME: 10:30AM - 12:00PM

Duration: 1.30 Hrs

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART - A	M	CO'S	BT'S
1.	What is lumped parameter method? Derive temperature variation for instantaneous heat transfer & total heat transfer expressions for a transient heat conduction.	10	C03	BT1 BT2
OR				
2.	A vertical cooling fin approximating a flat plate 40cm in height is exposed to saturated steam at atmospheric pressure ($t_{sat}=100^{\circ}\text{C}$). The fin is maintained at a temperature of 90°C . Estimate the following (i) thickness of the film at the bottom of the fin, (ii) Overall HTC, (iii) Heat transfer rate after incorporating McAdams's correction. The relevant fluid properties are: $\rho_l=965.3 \text{ kg/m}^3$, $k_l=0.68 \text{ W/m}^{\circ}\text{C}$, $\mu_l=3.153 \times 10^{-4} \text{ N-s/m}^2$.	10	C05	BT1 BT2
PART - B				
3.	An iron sphere ($K=60\text{W/m}^{\circ}\text{C}$, $C=460\text{J/kgK}$, $\rho=7850\text{kg/m}^3$) of diameter 5cm is initially at a uniform temperature $T = 225^{\circ}\text{C}$. Suddenly the surface of the sphere is exposed to an ambient at 25°C with heat transfer coefficient $h = 500\text{W/m}^2\text{K}$. Calculate i. the center temperature at $t = 2\text{min}$ after start of the cooling ii. Temperature at a depth 1cm from the surface at time $t = 2\text{min}$ after start of cooling iii. Energy removed from the sphere during this time period.	10	C03	BT1 BT2
OR				
4.	(a) Draw the Boiling curve & discuss the different regimes of boiling heat transfer.	06	C05	BT1 BT2
	(b) Write a short note on: (i) Filmwise Condensation & (ii) Dropwise Condensation.	04	C05	BT1 BT2
PART-C				
5.	A vertical square plate 300m x 300m is exposed to steam at atmospheric pressure. The plate temperature is 98°C . Calculate the heat transfer and the mass of steam condensed per hour	10	C05	BT1 BT2
OR				
6.	Explain the significance of Biot and Fourier numbers.	06	C03	BT2 BT2
	Write a note on Heister charts?	04	C03	BT2 BT2
PART-D				

7.	An aluminum wire, 1mm in diameter at 200°C is suddenly exposed to an environment at 30°C with $h=85.5 \text{ W/m}^2\text{K}$. Estimate the time required to cool the wire to 90°C, if the same wire were to place in air stream of $h=11.65 \text{ W/m}^2 \text{ K}$. What would be the time required to reach it to 90°C. Assume thermophysical properties $C=900 \text{ J/kg K}$, $\rho=2700 \text{ kg/m}^3$, $K=20 \text{ W/m K}$	05	C03	BT3
	An average human body modeled as a 30cm dia, 170cm long cylinder has 72% water by mass, so that its properties may be taken as those of water at room temperature $\rho= 1000\text{kg/m}^3$, $C=4180\text{J/kgK}$, $K=0.608\text{W/mK}$. A person is found dead at 5am in a room the temperature of which is 20°C. The temperature of the body is measured to be 25°C when found and the heat transfer coefficient is estimated to be $8\text{W/m}^2\text{K}$. Assuming the body temperature of a living man as 37°C, estimate the time of death of the above person.	05	C03	BT3
OR				
8.	The initial uniform temperature of a thick concrete wall ($a = 1.6 \times 10 \text{ m}^2/\text{s}$, $k=0.94 \text{ W/m}^\circ\text{C}$) of a jet engine test cell is 25°C. The surface temperature of the wall suddenly rises to 340°C when the combination of exhaust gases from the turbojet and spray of cooling water occurs. Determine: (i) The temperature at a point 80 mm from the surface after 8 hours. (ii) The instantaneous heat flow rate at the specified plane and at the surface itself at the instant mentioned at (i). Use the solution for semi-infinite solid.	10	C03	BT1 BT2
PART-E				
9.	A horizontal tube of outer diameter 20 mm is exposed to dry steam at 100°C. The tube surface temperature is maintained at 84°C by circulating water through it. Calculate the rate of formation of condensate per meter length of the tube.	10	C05	BT3 BT4
OR				
10.	(a) A steam condenser consisting of square array of 625 horizontal tubes, each 6mm in diameter, is installed at the exhaust hood of a steam turbine. The tubes are exposed to saturated steam at a pressure of 15kPa. If the tube surface temperature is maintained at 25°C, Calculate (i) The HTC, (ii) The rate at which steam is condensed per unit length of the tube.	10	C05	BT3 BT4

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analysing BT5- Evaluating BT6- Creating.

Course outcomes (CO's)

C05: Explain the principles of radiation heat transfer and understand the numerical formula for heat conduction problems.

CITY ENGINEERIN COLLEGE
DEPARTMENT OF .Mechanical Engg.....

SCHEME FOR VALUATION

Semester & Section: 7th 'A' & 'B' Internal Test 03

Date: 13/09/22

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<p align="center"><u>Part-A:-</u></p> Explan of lumped Method - Sketch - Definition	02 01 4+3	} 10.
2.	<p align="center">(01)</p> Sketch Data $Q = 231099.6 \text{ kJ/kg}$ $Q/A = 1459. \text{ kJ/kg}$ outy $Q = 834.05 \text{ kJ/kg}$	01 01 02 02	} 10.
3.	<p align="center"><u>PART-B:-</u></p> Sketch Data $Q/L = 600 \text{ W/m}$ $t_1 = 300.45^\circ\text{C}$	01 01 04 04	} 10.
4.	<p align="center">(02)</p> a) Sketch - 03 Explan of each stage b) Explan of both notes	$03 \times 1 = 03$ $01 \times 3 = 03$ $02 \times 2 = 04$	} 10.
5.	<p align="center"><u>Part-C:-</u></p> Data $Q = 2371.13 \text{ W}$ $h = 13172.95 \text{ W/m}^2\text{K}$ $m_s = 3.77 \text{ kg/hr}$	02 02 04 02	} 10.
	(02)		

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	a) Sign of each <u>no</u> (b) Sketch & Explan	$2 \times 3 = 06$ $02 + 02 = 04$	} 10.
<u>Part-D:-</u>			
7.	(A) Data $t = 3.2 \text{ sec}$ $t_{90\%} = 4.5$ (b) Data $t = 4.6 \text{ sec}$	01 03 01 01 04	} 10.
<u>OR</u>			
8.	Data $t = 223.45^\circ\text{C}$ $Q_i = -1303.08 \text{ W/m}^2$ $Q_s = -1476.4 \text{ W/m}^2$	01 02 03 03	} 6.
<u>Part-E:-</u>			
9.	Data $k = 11579.7 \text{ W/m}^\circ\text{C}$ $\frac{Q}{L} = 11641.2 \text{ W}$ $\frac{M}{L} = 18.56 \text{ kg/Ls}$	02 03 03 02	} 6.
<u>OR</u>			
10.	Data $k = 4845.6 \text{ W/m}^\circ\text{C}$ $m_1 = 1.116 \times 10^{-3} \text{ kg/Ls}$ $m/N = 0.6975 \text{ kg/Ls}$	02 03 03 02	} 6.

6th 'A' sec Heat 7

ATTENDANCE

ASSESSMENT

Sl. No.	Reg.No.	Name	22/11	23/11	24/11	25/11	30/11	31/11	5/12	6/12	7/12	12/12	13/12	14/12	15/12	16/12	17/12	% of Attendance	Test Marks					Sessional Marks	Remarks	
			1	4	2	1	4	2	1	3	2	1	1	4	2	4	2		1	1	2	3	Trials			Assign
			15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		30	50	50	50	30			10	25/10
1	ICEZOME00	SUHAS. B.	14	15	16	16	17	18	17	20	91	22	23	24	25	26	27	95%	35	30	50	27	10	37		
2	ICEZOME001	ABHILASH SUVAN.	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	93%	30	30	50	22	10	32		
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										
13																										
14																										
15																										
16																										
17																										
18																										
19																										
20																										
21																										
22																										
23																										
24																										
25																										
No. of Abs.																										
Initials			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*									

Name of the staff: HARSHA VARDHAN U

Dept: Mechanical Engineering

Class: 6th sem

Subject: Heat Transfer (18ME63)

Sl.No.	Date	Topics to be covered
1.	17/4/23	Module 1: Introductory concepts and definitions: Modes of heat transfer: Basic laws governing conduction, convection, and radiation heat transfer;
2.	18/4/23	Types of boundary conditions. General three dimensional Heat Conduction Equation: Derivation of the equation in (i) Cartesian, coordinate only.
3.	19/4/23	Discussion of three dimensional Heat Conduction Equation in (ii) Polar and (iii) Spherical Co-ordinate Systems.
4.	24/4/23	Steady-state one-dimensional heat conduction problems in Cartesian System: Steady-state one-dimensional heat conduction problems (i) without heat generation and (ii) constant thermal conductivity - in Cartesian system with various possible boundary conditions.
5.	25/4/23	Brief Introduction to variable thermal conductivity and heat generation [No numerical on variable thermal conductivity and heat generation] Thermal Resistances in Series and in Parallel.
6.	26/4/23	Critical Thickness of Insulation in cylinder and spheres Concept. Derivation
7.	02/5/23	Numerical problems
8.	03/5/23	Numerical problems
9.	08/5/23	Module-2, Extended Surfaces or Fins: Classification, Straight
10.	09/5/23	Rectangular and Circular Fins
11.	10/5/23	Temperature Distribution and Heat Transfer Calculations,
12.	15/5/23	Fin Efficiency and Effectiveness, Applications
13.	16/5/23	Transient [Unsteady-state] heat conduction: Definition, Different cases - Negligible internal thermal resistance, negligible surface resistance,
14.	17/5/23	comparable internal thermal and surface resistance, Lumped body
15.	23/5/23	Infinite Body and Semi-infinite Body,
16.	24/5/23	Numerical Problems, Heisler and Grober charts.
17.	29/5/23	Module 3: Numerical Analysis of Heat Conduction: Introduction, one-dimensional steady conduction
18.	30/5/23	One dimensional unsteady conduction,
19.	5/6/23	boundary conditions, solution methods.
20.	6/6/23	Thermal Radiation: Fundamental principles - Gray, White, Opaque, Transparent and Black bodies, Spectral emissive power,
21.	7/6/23	Wien's displacement law, Planck's laws, Hemispherical Emissive Power,
22.	12/6/23	Stefan-Boltzmann law for the total emissive power of a black body, Emissivity and Kirchhoff's Laws,
23.	13/6/23	View factor, Net radiation exchange between parallel plates,
24.	14/6/23	concentric cylinders, and concentric spheres, Radiation Shield.
25.	15/6/23	Module 4: Forced Convection: Boundary Layer Theory, Velocity and Thermal Boundary Layers, Prandtl number,
26.	16/6/23	Turbulent flow, Various empirical solutions, Forced convection flow over cylinders and spheres,

27.	19/6/23	Internal flows-laminar and turbulent flow solutions.
28.	20/6/23	Free convection: Laminar and Turbulent flows,
29.	21/6/23	Vertical Plates, Vertical Tubes and Horizontal Tubes, Empirical solutions.
30.	26/6/23	Numerical Problems.
31.	27/6/23	Numerical Problems.
32.	28/6/23	Numerical Problems.
33.	30/6/23	Module 5: Heat Exchangers: Definition, Classification, applications,
34.	3/7/23	LMTD method, Effectiveness - NTU method, Analytical Methods, Fouling Factors,
35.	3/7/23	Chart Solution Procedures for solving Heat Exchanger problems: Correction Factor Charts and Effectiveness-NTU Charts.
36.	4/7/23	Introduction to boiling: pool boiling, Bubble Growth Mechanisms, Nucleate Pool Boiling, Critical Heat Flux in Nucleate Pool Boiling.
37.	4/7/23	Pool Film Boiling, Critical Heat Flux, Heat Transfer beyond the Critical Point,
38.	5/7/23	Filmwise and dropwise Condensation.
39.	5/7/23	Numerical Problems.
40.	6/7/23	Numerical Problems.

Text Books:

1. Heat & Mass transfer, by Tirumaleshwar, Pearson-2006
2. Heat transfer, by P.K. Nag, Tata Mc Graw Hill 2002
3. Heat transfer-A basic approach, Ozisik, Tata McGraw Hill 2002

Reference Books:

1. Heat transfer, a practical approach, Yunus A- Cengel Tata Mc Graw Hill
2. Principles of heat transfer by Kreith Thomas Learning 2001
3. Fundamentals of heat and mass transfer by Frenk P. Incropera and David P. Dewitt, John Wiley and son's.
4. Heat and Mass Transfer, by B K Venkanna, Ellite Publisher, Mangalore.


Staff Signature


HOD

CIRCULAR

Ref No: CEC/ME/DAC/ACY 2022-2023/01

Date: 16-09-2022

This is to inform the members of Department Advisory Committee that meeting is scheduled on 16-09-2022 at 10: 00 AM in ME department.

Agenda:

- Planning of Internships & Project work for 7th semester students.
- Involving students in technical activities.
- Planning of AICTE activities for 7th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning to improve result of students.
- Planning of Course preference, Course allocation & Work load distribution for upcoming odd semester.

S Karunakara

Dr.S.Karunakara

HOD

DEPARTMENT OF MECHANICAL ENGINEERING

Department Advisory Committee Meeting

Date: 16/09/2022

Time: 10:00 AM

Venue: ME Department

DAC Members Present:

Sl. No	Member Name	Designation	Role	
1	Dr. S Karunakara	HOD	Convenor	<i>SK</i>
2	Dr. Uma T R	Professor	Member	<i>USTR</i>
3	Mr. Mathenulla Shariff	Professor	Co-Convenor	<i>MS</i>
4	Harsha Vardhan U	Assistant Professor	Member	<i>HV</i>
5	Anil Kumar R	Assistant Professor	Member	<i>AKR</i>
6	Shruti Naik	Assistant Professor	Member	<i>SN</i>
7	Vijay Kumar	Assistant Professor	Member	<i>VK</i>
8	Sampath H P	Assistant Professor	Member	<i>SH</i>
9	Rakesh Y D	Assistant Professor	Member	<i>RYD</i>
10	Shivaraja H B	Assistant Professor	Member	<i>SHB</i>
11	Bharath P T	Assistant Professor	Member	<i>BPT</i>
12	Shashank	Consultant	Alumni	<i>SS</i>

The Department Advisory Committee meeting was conducted at Department of ME, on 16th September, 2022, at 10 AM.

Agenda of the Meeting:

- Planning of Internships & Project work for 7th semester students.
- Involving students in technical activities.
- Planning of AICTE activities for 7th semester students.
- Conducting workshop/seminar/guest lectures.
- Planning to improve result of students.
- Planning of Course preference, Course allocation & Work load distribution for upcoming odd semester.

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The HOD welcomed all the staff for the meeting. The following points were discussed as follows.

- Strategy has to be made to improve admissions by visiting nearby diploma colleges to improve lateral entry. The responsibilities are given to Mr. Jayanth K S for identifying polytechnics in the near vicinity.
- It was proposed to conduct a workshop, seminars & guest lecture on recent trending topics.
- The staff members were informed to conduct classes and labs regularly, to timely conduct and complete the entrusted responsibility, to actively participate in the dept and college activities and finally to take suitable actions for getting results and admissions to the dept.
- The guide has to check and discuss about the internship practice taken by students of 7th semester allocated to him or she. The guide must visit the site where internship is practiced by the students and discuss with supervisor of students at the site. The staff members should complete all the five modules and work hard to get 100% pass percentage. The staff members should find out the reasons for poor percentage in the concerned subject and submit report.
- Ant ragging committee should go for inspection at least once in a day. Weekly reports should be submitted by respective faculties to the HOD.

HOD thanked all the staff for having attended the meeting.

Skarun

Dr.S.Karunakara

HOD



CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2022-23 (Odd SEM), Department of Mechanical Engineering

Feb 2023		March 2023		April 2023		May 2023		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
WED	1	1st Sem –I CIE	1	1st Sem –II CIE				
THU	2		2					
FRI	3		3					
SAT	4	4	1		III SEM LAST WORKING DAY III test DIP			
SUN	5		5		2			
MON	6		6	I test -DIP	3	III test DIP & II test -8thsem Ist sem practical exam	1	KARMIKARA DINACHARANE
TUE	7		7	I test-DIP	4	3 rd sem practical exam	2	
WED	8		8	Women's day	5		3	
THU	9	5 th sem practical ends	9		6		4	
FRI	10	Talents day	10		7	GOOD FRIDAY	5	
SAT	11	2 nd Saturday holiday	11	2 nd Saturday holiday	8	2 nd Saturday holiday	6	2 nd Saturday holiday
SUN	12		12		9		7	
MON	13	8 th sem commencement	13	I test 8 th Sem	10		8	III test-8 th sem
TUE	14		14		11		9	
WED	15		15	3 rd sem-III CIE & II test	12		10	
THU	16	5 th sem theory exam starts	16	3 rd sem-III CIE & II test	13		11	
FRI	17		17	3 rd sem-III CIE & II test	14	Dr. B. R. AMBEDKAR JAYANTI	12	
SAT	18	MAHA SHIVARATHRI	18	5 th sem theory exam ends	15		13	
SUN	19		19		16		14	
MON	20		20	6 th semester commencement	17	I st & 3rd sem theory Examination	15	Commencement of II/IV SEM
TUE	21		21		18		16	
WED	22		22	CHANDRAMANA UGADI	19		17	
THU	23		23		20		18	
FRI	24		24		21		19	
SAT	25	4 th Saturday holiday	25	4 th Saturday holiday	22	Alumni day	20	4 th Saturday holiday
SUN	26		26		23		21	
MON	27		27	1st sem –III CIE	24		22	
TUE	28		28		25		23	
WED			29		26		24	
THU			30		27		25	
FRI			31	I SEM LAST WORKING DAY- COLLEGE DAY	28		26	
SAT					29		27	
SUN					30		28	
MON							29	
TUE							30	
WED							31	

Startan



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23 (ODD)

Department of Mechanical Engineering

COURSE PREFERENCE

Name of the Faculty: Dr. M.P. Matherulla Shariff

Designation: Professor

Sl. No	Course Code and Name	Year/Semester
1	1BCSK104D / Introduction to Mechanical Engrs.	I / I
2.	18ME54 - DME - I	III / V
3.	18MBL77 - Delegation	IV / V II


Signature of Faculty



CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-2023
(ODD)

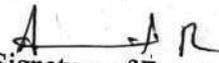
Department of Mechanical Engineering

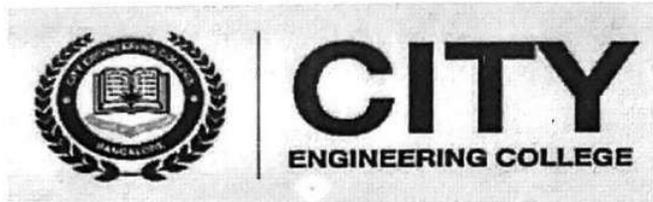
COURSE PREFERENCE

Name of the Faculty: Anil Kumar. R

Designation: Assistant professor.

Sl. No.	Course Code and Name	Year/Semester
1	BCEDR103/CAED	I/I
2.	18ME734/TQM	IV/VII
3.	18ME176/CFM lab	IV/VII


Signature of Faculty



ACADEMIC YEAR: 2022-23(ODD)

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/	Signature
			Semester	
1	Dr. S Karunakara	18ME754, 18ME51	VII, V	
2	Dr. Uma T R	18ME73, 18ME56	VII, V	
3	Mr. Mathenulla Shariff	BCSCK104D, 18ME55	I, V	
4	Harsha Vardhan U	18ME51, 18ME34	V, III	
5	Anil Kumar R	18ME32, BCSCK104D	III, I	
6	Shruti Naik	BCEDK103, 18ME35	I, III	
7	Vijay Kumar	18ME54, 18ME34	V, III	
8	Sampath H P	18ME71, 18ME31	III, VII	
9	Rakesh Y D	18ME72, 18ME33	VII, III	
10	Shivaraja H B	18ME31, 18ME56	III, V	
11	Bharath P T	BCEDK103, 18ME55	I, V	

Skaran

HOD

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2022-2023 TIME TABLE

SEMESTER: III ME 'A' SEC CBCS

2021 SCHEME

CLASS ROOM: A106

DAY	9:00 - 10:00 AM	10:00 - 11:00 AM	11:00 - 11:15 AM	11:15 AM - 12:15 PM	12:15 PM - 1:15 PM	LUNCH	2:00 – 3:00 PM	3:00 – 4:00 PM	4:00 – 5:00 PM
MON	21MAT31	21ME33	BREAK	21ME32	21ME34	L U N C H			
TUE	21ME33	21ME32		21MAT31	21ME34		21MEL35		
WED	21ME32	21ME33		21MAT34	21ME31				
THU	21ME34	21MAT31		21ME33	21ME32				
FRI	21ME33	21KSK37		21UH36			DEPARTMENT ACTIVITY		
SAT	NSS/SPORTS/YOGA BNSK359/BPEK359/BYO K359			NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK35 9					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
21MAT31	Transform Calculus, Fourier Series & numerical Techniques	Prof Vanitha G R
21ME32	Metal Casting, Forming & Joining process	Prof Anil Kumar R
21ME33	Material Science and Engineering	Prof Rakesh Y D
21ME34	Basic Thermodynamics	Prof Harshavardhan U
21MEL35	Machine Drawing	Prof Shruti Naik
21UH36	SCR	Prof Vinay Kumar H M
21KSK37	Sanskritika Kannada	Prof Deepa R

Skandan
HOD, Dept. of ME

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2022-2023 TIME TABLE

SEMESTER: V ME 'A' SEC CBCS

2018 SCHEME

CLASS ROOM: A104

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	18ME51	18ME53	<i>B R E A K</i>	18ME581	18ME54	<i>L U N C H</i>	18MEL55		
TUE	18ME53	18ME54		18ME581	18ME52				
WED	18ME51	18ME581		18ME52	18ME54				
THU	18ME52	18ME53		18ME52	18ME54				
FRI	18ME52	18MEL581		18MEL53	18ME51				
SAT									

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18ME51	Management & Economics	Prof Shruti Naik
18ME52	Design of Machine Elements I	Prof Sampath H P
18ME53	Dynamics of Machines	Veeresh Naik
18ME54	Turbo Machines	Prof Vijay Kumar
18ME55	Fluid Power Engineering	Prof Anil Kumar
18ME56	Operations Management	Dr Uma T R
18MEL57	Fluid Mechanics Lab	Prof Harshavardhan U
18MEL58	Energy Conversion Lab	Prof Sampath H P

S. Karan
HOD, Dept. of ME

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2022-2023 TIME TABLE

SEMESTER: VII ME 'A' SEC CBCS

2018 SCHEME

CLASS ROOM: A106

DAY	1	2	TEA	3	4	LUNCH	5	6	7
MON	18ME71	18ME734	BREAK	18ME72	18ME741	L U N C H	DESIGN LAB		
TUE	18ME72	18ME71		18ME741	18ME734		MAJOR PROJECT PHASE-I		
WED	18ME71	18ME72		18ME734	18ME741				
THU	18ME741	18ME71		18ME72	18ME734				
FRI	CIM LAB			MAJOR PROJECT PHASE-II			DEPARTMENT ACTIVITY		
SAT	NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK359			NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK359					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18ME71	Control Engineering	Dr. Uma T R
18ME72	CAD/CAM	Prof Rakesh Y D
18ME734	Total Quality Management	Shruti Naik
18ME741	Additive Manufacturing	Prof Anil Kumar
18ME754	Non-Conventional Energy Resources	Dr. S Karunakara
18MEL76	CIM LAB	Prof Shruti Naik
18MEL77	DESIGN LAB	Prof Sampath H P

Stallan
HOD, Dept. of ME

CITY ENGINEERING COLLEGE
(Doddakallsandra, Off Kanakapura Road, Bangalore-560061)
Department of Mechanical Engineering



Faculty Academic File

NAME: Md. Mathenulla Shanif

DESIGNATION: Asst. Professor

SEMESTER: II

SECTION: 'D'

SUBJECT NAME & CODE: Introduction to Mech. Engg.
BESCK104D

ACADEMIC YEAR: 2022-2023

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING
Individual Time Table 2022-2023 TIME TABLE

Faculty: Mohammed Mathenullah Shariff

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	EME-D		B R E A K		18ME62	L U N C H	18MEL66		
TUE				18ME62	21ME44				
WED	18ME62			18ME62	EME-D				
THU					21ME44				
FRI	21ME44								
SAT	EME-D								

Topic
Module 1 : Introduction to Mechanical Engineering
Role of Mechanical Engineering in Industries
Role of Mechanical Engineering in Society
Emerging Trends and Technologies in different sectors such as Energy, Manufacturing
Automotive, Aerospace
Marine sectors.
Introduction and applications of Energy sources like Fossil fuels
Nuclear fuels, Hydel
Solar, wind, and bio-fuels
Environmental issues like Global warming and Ozone depletion
Module 2 : Machine Tool Operations :Working Principle of lathe
Lathe operations: Turning, facing, knurling.
Working principles of Drilling Machine
drilling operations: drilling, boring, reaming.
Working of Milling Machine
Milling operations: plane milling and slot milling.
Introduction to Advanced Manufacturing Systems
Introduction, components of CNC, advantages and applications of CNC, 3D printing
Module 3 : Introduction to IC Engines: Components and Working Principles
4-Stroke Petrol Engine
4- Stroke Diesel Engine, Application of IC Engines.
Insight into Future Mobility; Electric and Hybrid Vehicles.
Components of Electric . Advantages and disadvantages of EVs
Components of Hybrid Vehicles. Advantages and disadvantages of Hybrid vehicles
Module 4 : Engineering Materials: Types and applications of Ferrous & Nonferrous Metals
Silica, Ceramics, Glass, Graphite
Diamond and polymer, Shape Memory Alloys
Joining Processes: Soldering, Brazing, Welding
Definitions, Classification of welding process, Arc welding
Gas welding and types of flames
Module 5 : Introduction to Mechatronics and Robotics: open-loop and closed-loop mechatronic systems.
Classification based on robotics configuration: polar cylindrical
Cartesian coordinate and spherical.
Application, Advantages and disadvantages.
Automation in industry: Definition, types – Fixed, programmable and flexible automation
Basic elements with block diagrams, advantages.
Introduction to IOT: Definition and Characteristics
Physical design, protocols, Logical design of IoT, Functional blocks and communication models.
Students Seminar

QUESTION BANK-2

INTRODUCTION TO MECHANICAL ENGINEERING- BESCK104D

1. With the help of P-V diagram, explain the operation of with neat sketches
 - (a) 4-Stroke Diesel engine.
 - (b) 4-Stroke Petrol engine.
2. Explain IC Engine terminologies along with sketch.
3. List the advantages & disadvantages of Electric Vehicles & Hybrid Vehicles.
4. Give a brief comparison between
 - (a) Soldering Vs Brazing
 - (b) SI Engine v/s CI Engine.
5. With a neat sketch explain the process of Arc welding.
6. What is gas welding? With a neat sketch explain the principle of operation of Oxy-Acetylene Gas welding.
7. With the help of line diagram describe the working principle of Electric vehicle.
8. Discuss the need of Electric and Hybrid vehicles.
9. Define engineering material. Briefly explain the classification of ferrous and non-ferrous metals.
10. Define the following terms i) Ceramics ii) Graphite iii) Polymers iv) Shape Memory Alloy

QUESTION BANK-1

INTRODUCTION TO MECHANICAL ENGINEERING- BESCK104D

- 1. Briefly explain the emerging trends of Mechanical Engineering in Manufacturing and Energy Sector.**
- 2. Explain the role of Mechanical Engineering in Industry and Society**
- 3. Define Energy. Distinguish between Conventional & Non-Conventional sources of energy.**
- 4. What is solar Energy? Apply the Solar energy conversion technique into electrical energy in a solar cell.**
- 5. Enumerate the method of extracting energy from Wind with a neat sketch.**
- 6. Discuss the conversion of hydel energy into supply of power transmission along with schematic diagram.**
- 7. Define Fossil fuel. Explain briefly the types of fossil fuels.**
- 8. Explain the working principle of Lathe. Explain different machining operations performed on lathe along with neat schematic sketches like facing, turning, knurling and taper turning**
- 9. Explain the working of milling m/c. with a neat sketch explain different machining operations performed on milling m/c like drilling, reaming, plane milling and slot milling**
- 10. Explain the components of CNC m/c. List the advantages & disadvantages of CNC m/c.**

Course Title:	INTRODUCTION TO MECHANICAL ENGINEERING		
Course Code:	BESCK104D/204D	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:0:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03
Course Learning Objectives			
<ul style="list-style-type: none"> To develop basic Knowledge on Mechanical Engineering, Fundamentals and Energy Sources. Understand the concept of different types of Machine tool operations and Modern Manufacturing Processes like CNC, 3D printing. To know the concept of IC engines and Future Mobility vehicles. To give exposure in the field of Engineering Materials and Manufacturing Processes Technology and its applications To acquire a basic understanding role of Mechanical Engineering in the Robotics and Automation in industry. 			
Teaching-Learning Process			
<ul style="list-style-type: none"> Adopt different types of teaching methods to develop the outcomes through PowerPoint presentations and Video demonstrations or Simulations. Arrange visits to show the live working models other than laboratory topics. Adopt collaborative (Group Learning) Learning in the class. Adopt Problem Based Learning (PBL), which fosters students Analytical skills and develops thinking skills such as evaluating, generalizing, and analyzing information. 			
Module-1 (8 hours)			
Introduction: Role of Mechanical Engineering in Industries and Society- Emerging Trends and Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors.			
Energy: Introduction and applications of Energy sources like Fossil fuels, Nuclear fuels, Hydel, Solar, wind, and bio-fuels, Environmental issues like Global warming and Ozone depletion			
Module-2 (8 hours)			
Machine Tool Operations:			
Working Principle of lathe, Lathe operations: Turning, facing, knurling. Working principles of Drilling Machine, drilling operations: drilling, boring, reaming. Working of Milling Machine, Milling operations: plane milling and slot milling.			
(No sketches of machine tools, sketches to be used only for explaining the operations).			
Introduction to Advanced Manufacturing Systems: Introduction, components of CNC, advantages and applications of CNC, 3D printing.			
Module-3 (8 hours)			
Introduction to IC Engines: Components and Working Principles, 4-Stroke Petrol and Diesel Engines, Application of IC Engines.			
Insight into Future Mobility; Electric and Hybrid Vehicles, Components of Electric and Hybrid Vehicles. Advantages and disadvantages of EVs and Hybrid vehicles.			
Module-4 (8 hours)			
Engineering Materials: Types and applications of Ferrous & Nonferrous Metals, silica, ceramics, glass, graphite, diamond and polymer. Shape Memory Alloys.			
Joining Processes: Soldering, Brazing and Welding, Definitions, classification of welding process, Arc welding, Gas welding and types of flames.			
Module-5 (8 hours)			

Introduction to Mechatronics and Robotics: open-loop and closed-loop mechatronic systems. Classification based on robotics configuration: polar cylindrical, Cartesian coordinate and spherical. Application, Advantages and disadvantages.

Automation in industry: Definition, types – Fixed, programmable and flexible automation, basic elements with block diagrams, advantages.

Introduction to IOT: Definition and Characteristics, Physical design, protocols, Logical design of IoT, Functional blocks, and communication models.

Course Outcome (Course Skill Set)

At the end of the course the student will be able to:

C01	Explain the concepts of Role of Mechanical Engineering and Energy sources.
C02	Describe the Machine Tool Operations and advanced Manufacturing process.
C03	Explain the Working Principle of IC engines and EV vehicles.
C04	Discuss the Properties of Common Engineering Materials and various Metal Joining Processes.
C05	Explain the Concepts of Mechatronics, Robotics and Automation in IoT

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation(CIE):

Three Tests each of **20 Marks**;

- 1st, 2nd, and 3rd tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- Assignments/Seminar/quiz/group discussion /field survey & report presentation/ course project/Skill development activities, suitably planned to attain the COs and POs for a total of **40 Marks**.

If the nature of the courses requires assignments/Seminars/Quizzes/group discussion two evaluation components shall be conducted. If course project/field survey/skill development activities etc then the evaluation method shall be one.

Total CIE marks (out of 100 marks) shall be scaled down to **50 marks**

Semester End Examination(SEE):

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

Suggested Learning Resources:**Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)****Text Books:**

1. Elements of Mechanical Engineering, K R Gopala Krishna, Subhash Publications, 2008
2. An Introduction to Mechanical Engineering, Jonathan Wickert and Kemper Lewis, Third Edition, 2012

Reference Books:

1. Elements of Workshop Technology (Vol. 1 and 2), Hazra Choudhry and Nirzar Roy, Media Promoters and Publishers Pvt. Ltd., 2010.
2. Manufacturing Technology- Foundry, Forming and Welding, P.N.Rao Tata McGraw Hill 3rdEd., 2003.
3. Internal Combustion Engines, V. Ganesan, Tata McGraw Hill Education; 4th edition, 2017
4. Robotics, Appu Kuttan KK K. International Pvt Ltd, volume 1
5. Dr SRN Reddy, Rachit Thukral and Manasi Mishra, " Introduction to Internet of Things: A Practical Approach", ETI Labs
6. Raj kamal, " Internet of Things: Architecture and Design", McGraw hill.

Web links and Video Lectures (e-Resources):

- <https://rakhoh.com/en/applications-and-advantages-of-steam-in-manufacturing-and-process-industry/>
- [Videos | Makino \(For Machine Tool Operation\)](#)

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Demonstration of lathe/milling/drilling operations
- Demonstration of working of IC Engine.
- Study arc welding, oxy-acetylene gas flame structure.
- Video demonstration of latest trends in mobility robotics and Automation
- Demonstration of developing models on machine tools

COs and POs Mapping (CO-PO mappings are only Indicative)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3					1	2			1		1
CO2	3					1	1			1		1
CO3	3					1	1			1		1
CO4	3					1	1			1		1
CO5	3					1	1			1		1

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

21EME15/25

First/Second Semester B.E. Degree Examination, June/July 2023 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. Use of Steam table is permitted

Module-1

- 1 a. Enumerate the roles of mechanical engineering in industries and society. (04 Marks)
b. Define : i) Sensible heat ii) latent heat iii) Dry steam v) Wet steam vi) Dryness fraction. (10 Marks)
c. Find the enthalpy of 1kg of steam at 12 bar when,
i) Steam is dry saturated
ii) Steam is 22% wet
iii) Super heated to 250°C
Assume the specific heat of the super heated steam as 2.25 kJ/KgK. (06 Marks)

OR

- 2 a. Differentiate between Renewable and Non-renewable energy sources. (04 Marks)
b. With a neat sketch, explain the working principle of Hydel power plant. (08 Marks)
c. Explain with neat sketch Pelton Wheel. (08 Marks)

Module-2

- 3 a. Write a note on smart materials and shape memory alloys. (06 Marks)
b. Differentiate between ferrous and Non ferrous metals. (06 Marks)
c. What is Composite? List the applications of composite materials. (08 Marks)

OR

- 4 a. With a neat sketch, explain Arc Welding. (08 Marks)
b. Differentiate between soldering and brazing. (06 Marks)
c. Define three modes of heat transfer. (06 Marks)

Module-3

- 5 a. Differentiate between 2-stroke and 4-stroke engine. (06 Marks)
b. With neat sketch, explain working principle of 4-stroke Diesel engine. (08 Marks)
c. What are the advantages and disadvantages of electric vehicles? (06 Marks)

OR

- 6 a. Define the following :
i) Refrigeration effect
ii) Ton of Refrigeration
iii) Unit of Refrigeration
iv) Coefficient of Performance (COP)
v) Ice making capacity (10 Marks)
b. With neat sketch, explain the working of vapour compression refrigeration spectrum. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Explain with neat sketches,
i) Spur gear
ii) Helical gear
iii) Bevel gear (08 Marks)
- b. Derive the length of the belt in open drive (08 Marks)
- c. What are the advantages and disadvantages of gear drive? (04 Marks)

OR

- 8 a. Explain with neat sketch loading and unloading mechanism. (10 Marks)
- b. Explain with neat sketch Robot configurations. (10 Marks)

Module-5

- 9 a. Explain with neat sketches, the following operations
i) Plain Turning
ii) Facing
iii) Taper-Turning
iv) Knurling (10 Marks)
- b. With neat sketch, explain working of Horizontal Milling Machine. (10 Marks)

OR

- 10 a. Explain the components of CNC with neat block diagram. (08 Marks)
- b. What are the Advantages and Disadvantages of CNC? (08 Marks)
- c. Differentiate between open loop and closed loop control system. (04 Marks)

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

18ME15/25

First/Second Semester B.E. Degree Examination, June/July 2023 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of steam tables is permitted.*

Module-1

- 1 a. Define the term fuel. Write a note on solid fuels. (06 Marks)
b. With the help of neat diagram, explain the construction and working nuclear power plant. (08 Marks)
c. Write notes on the following: (i) Ozone depletion (ii) Global warming (06 Marks)

OR

- 2 a. Define the term thermodynamics. State first and second law of thermodynamics. (06 Marks)
b. With the help of a Temperature-Enthalpy (T-h) diagram, explain the formation of steam at a constant pressure. (06 Marks)
c. 5 kg of wet steam of dryness 0.8 passes from a boiler to a super heater at a constant pressure of 1 MPa absolute. In the superheater its temperature increases to 350°C. Determine the amount of heat supplied in the superheater. The specific heat of superheated steam $C_{ps} = 2.25$ kJ/kgK. (08 Marks)

Module-2

- 3 a. Define the term boiler. Classify the boilers. (06 Marks)
b. With the help of a neat sketch, explain the construction and working of a Babcock and Wilcox boiler. Indicate clearly flow of flue gases. (10 Marks)
c. List the boiler mountings. (04 Marks)

OR

- 4 a. Define the term prime mover. Explain the principle of working of impulse and reaction turbine. (06 Marks)
b. With the help of neat sketch, explain the construction and working of Francis turbine. (08 Marks)
c. What is meant by cavitation and priming? (06 Marks)

Module-3

- 5 a. Define the term Internal Combustion Engine. Classify the Internal Combustion Engine. (06 Marks)
b. With the help of PV diagram, explain the working of four stroke diesel engine. (08 Marks)
c. Explain the desirable properties of an ideal refrigerant. (06 Marks)

OR

- 6 a. Explain the working of a vapour absorption refrigeration system with neat sketch. (07 Marks)
b. The following readings were taken on a four stroke I.C. engine:
Diameter of the brake drum = 1.5 m Diameter of the rope = 10 mm
Load suspended on the brake drum = 100 kg Spring balance reading = 5 kg
Crankshaft speed = 200 rpm
Determine the brake power of the engine. (07 Marks)
c. With the help of neat sketch, explain the working of room air conditioner. (06 Marks)

Module-4

- 7 a. What are the properties of cast iron and aluminium? (08 Marks)
b. Differentiate between welding, brazing and soldering. (06 Marks)
c. Write a note on smart materials. (06 Marks)

OR

- 8 a. With the help of neat sketch, explain Tungsten Inert Gas (TIG) Welding. (06 Marks)
b. Obtain an expression for the ratio of tensions in case of flat belt. (07 Marks)
c. List the advantages and disadvantages of gear drives over belt drives. (07 Marks)

Module-5

- 9 a. With neat sketch, highlight the specification of lathe. (06 Marks)
b. With the help of neat sketch, explain taper turning by tailstock set over method. (06 Marks)
c. Explain briefly, with the help of neat sketches, following operations:
(i) Straddle milling (ii) Gang milling
(iii) Slab milling (iv) Angular milling (08 Marks)

OR

- 10 a. Define the term Computer Numerical Control (CNC). Explain the basic components of CNC. (06 Marks)
b. Define the term manipulator. Briefly explain the five type of joints that are used in industrial robot construction. (08 Marks)
c. List the industrial robot application in the processing operations. (06 Marks)

USN

--	--	--	--	--	--	--	--	--	--


CITY
ENGINEERING COLLEGE

Department of Mechanical Engineering
Subject: ELEMENTS OF MECHANICAL ENGG
SEM: 2ND 'D' 'E' 'F'
Second Internal Test
Max Marks :25
Duration: 1 Hour
Date: -05/09/2023
Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART - A	M	CO'S	BT'S
1.	1. With the help of P-V diagram, explain the operation of 4-Stroke Petrol engine.	05	C01	BT1 BT2
OR				
2.	Define Electric vehicle (EV). Explain the different components of EV with a block diagram.	05	C01	BT1 BT2
PART - B				
3.	With the help of P-V diagram, explain the operation of 4-Stroke Diesel engine.	05	C01	BT2 BT3
OR				
4.	Define Hybrid Electric vehicle (HEV). Explain the different components of HEV with a block diagram.	05	C01	BT2 BT3
PART-C				
5.	Define Engineering Materials. Briefly explain the classification of Ferrous and Non Ferrous Metals	05	C02	BT2 BT3
OR				
6.	Describe the following Materials i) Ceramics ii) Shape memory Alloys	05	C02	BT2 BT3
PART-D				
7.	Describe the construction & working of Arc welding process with neat sketch	05	C01	BT2 BT3
OR				
8.	6. What is gas welding? With a neat sketch explain the principle of operation of Oxy-Acetylene Gas welding.	05	C02	BT2 BT3
PART-E				
9.	Describe the three types of carbon steels with applications	05	C01	BT2 BT3
OR				
10.	Give a brief comparison between (a) Soldering Vs Brazing	05	C01	BT2 BT3

Blooms Taxonomy Levels (BTL)
BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analysing BT5- Evaluating BT6- Creating.
Course outcomes (CO's): C01- The concepts of Role of Mechanical Engineering and Energy sources.
C02 - The Machine Tool Operations and advanced Manufacturing process.

CBCS SCHEME

USN

) C E 2 2 C S 1 3 7

BESCK204D/BESCKD204

Second Semester B.E./B.Tech. Degree Examination, June/July 2023 Introduction to Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module - 1			M	L	C
Q.1	a.	Discuss the role of mechanical engineering in Industries and Society.	10	L2	CO1
	b.	Explain the emerging trends and technologies in following sectors: (i) Energy sector (ii) Manufacturing sector (iii) Marine sector (iv) Aerospace sector	10	L2	CO1
OR					
Q.2	a.	With a neat sketch, explain the working principle of Nuclear Power Plant.	10	L2	CO1
	b.	Explain some of the engineering applications of bio-fuels.	10	L2	CO1
Module - 2					
Q.3	a.	Explain the working principle of Lathe, drilling and milling machine.	10	L2	CO2
	b.	With a neat sketch, explain the following operations performed on lathe machine : (i) Turning (ii) Facing (iii) Knurling	10	L2	CO2
OR					
Q.4	a.	What is CNC? Explain the basic components of CNC with a neat sketch.	10	L2	CO2
	b.	List the advantages and applications of CNC.	10	L1	CO2
Module - 3					
Q.5	a.	With a neat sketch, explain the working principle of 4-stroke Petrol Engine along with PV diagram.	10	L2	CO3
	b.	With a neat sketch, list and explain the components of IC engine.	10	L2	CO3
OR					
Q.6	a.	What are electric and hybrid vehicles? List the advantages and disadvantages of EVs and hybrid vehicles.	10	L1	CO3
	b.	Explain the components of electric and hybrid vehicle with a neat sketch.	10	L2	CO3
Module - 4					
Q.7	a.	Discuss composition, properties and applications of ferrous and nonferrous metals.	10	L2	CO4
	b.	Write a note on shape memory alloys.	10	L2	CO4
OR					
Q.8	a.	Differentiate between soldering, brazing and welding.	10	L2	CO4
	b.	Explain the working principle of Arc Welding with a neat sketch.	10	L2	CO4
Module - 5					
Q.9	a.	Explain the classification of robot based on robot configuration.	10	L2	CO5
	b.	Explain the elements of automated system and list its advantages.	10	L2	CO5
OR					
Q.10	a.	Define IoT and explain the characteristics of IoT.	10	L2	CO5
	b.	Explain the physical design and protocols of IoT.	10	L2	CO5

CBCS SCHEME

USN

A C E 2 2 A 1 0 1 9

BESCK104D/BESCKD104

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023

Introduction to Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module - 1			M	L	C
Q.1	a.	Difference between renewable and non-renewable energy sources.	6	L2	CO1
	b.	Briefly explain the role of Mechanical Engineering in Industries and Society.	6	L2	CO1
	c.	Illustrate the operation of liquid flat plate collector and solar-photo-voltaic cells with neat sketch.	8	L2	CO1
OR					
Q.2	a.	Briefly describe the Emerging Trends and Technologies in any two sectors.	6	L2	CO1
	b.	With neat sketch, explain the working of Hydel Power Plant.	6	L2	CO1
	c.	Illustrate the operation of Wind Mill with neat sketch.	8	L2	CO1
Module - 2					
Q.3	a.	Define lathe. With neat sketch and explain the following machining operations. i) Turning ii) Knurling ii) Facing iv) Boring	10	L2	CO2
	b.	Define CNC. With block diagram, explain the different components used in CNC.	10	L2	CO2
OR					
Q.4	a.	Define milling machine. With neat sketch, explain the following machining operations: i) Drilling ii) Plane-Milling ii) Reaming iv) Slot Milling	10	L2	CO2
	b.	Write the advantages and applications of CNC.	6	L2	CO2
	c.	Define 3-D printing and classify.	4	L2	CO2
Module - 3					
Q.5	a.	With neat sketch and explain the working of 4-stroke petrol engine. And also write its P-V diagram.	10	L2	CO3
	b.	Define EV (Electric Vehicle). With block diagram, explain the different components used in EV. Also write benefits of EV in current trend.	10	L2	CO3

OR					
Q.6	a.	With neat sketch and explain the working of 4-stroke diesel engine. And also write its P-V diagram.	10	L2	CO3
	b.	Define HEV (Hybrid Electric Vehicle). With block diagram, explain the different components used in HEV. Also write limitations of EV's in current trend.	10	L2	CO3
Module - 4					
Q.7	a.	Define Engineering Material. Briefly explain the classifications of ferrous and non-ferrous metals.	10	L2	CO4
	b.	Define welding. With neat sketch, explain the working of Electric Arc Welding.	10	L2	CO4
OR					
Q.8	a.	Define the following terms: i) Ceramic ii) Graphite iii) Polymers iv) Shape Memory Alloy	10	L1	CO4
	b.	Define Soldering. With neat sketch, explain the working of Gas welding and name the different types of flames used in oxy-acetylene welding.	10	L2	CO4
Module - 5					
Q.9	a.	With a neat sketch, explain the open-loop and closed-loop mechatronic systems.	10	L2	CO5
	b.	Define Automation. Explain the classifications of automation.	10	L2	CO5
OR					
Q.10	a.	Define Industrial Robot. Explain the different configurations of Robot with neat sketch.	10	L2	CO5
	b.	Define IOT. Briefly explain the characteristics of IOT.	6	L2	CO5
	c.	Explain the logical design of IOT.	4	L2	CO5

* * * * *

USN

--	--	--	--	--	--	--	--	--	--

**CITY
ENGINEERING COLLEGE
FIRST INTERNAL TEST**

PROGRAMME: IS, AI & ML

COURSE NAME: INTRODUCTION TO MECHANICAL ENGG

SEM: 1ST 'A' & 'B'

Duration: 1.30 Hrs

DATE: 03/02/2023

TIME: 10:30AM - 12:00PM

MAX MARKS: 40

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.		M	CO'S	BT'S
PART - A				
1.	(a) Distinguish between conventional & non-conventional sources of energy.	04	C01	BT2 BT3
	(b) Briefly explain the emerging trends of Mechanical Engineering in Manufacturing and Energy Sector.	04		
OR				
2.	Discuss the conversion of Hydel energy into supply of power transmission along with schematic diagram.	08	C01	BT2 BT3
PART - B				
3.	Explain the Construction & Working of Lathe.	08	C02	BT2 BT3
OR				
4.	Explain different machining operations performed on Lathe along with schematic sketches.	08	C02	BT2 BT3
PART-C				
5.	Explain the Construction & working of Milling m/c.	08	C02	BT2 BT3
OR				
6.	With a neat sketch explain different machining operations performed on Milling m/c.	08	C02	BT2 BT3
PART-D				
7.	Explain the working of Non-conventional source of energy conversion of desalination process to useful work along with schematic diagram.	08	C01	BT2 BT3
OR				
8.	Explain the components of CNC m/c. List the advantages & disadvantages of CNC m/c.	08	C02	BT2 BT3
PART-E				
9.	What is Solar Energy? Apply the Solar energy conversion technique into electrical energy in a solar cell.	08	C01	BT2 BT3
OR				
10.	Enumerate the method of extracting energy from Wind with a neat sketch.	08	C01	BT2 BT3

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 - Applying BT4 - Analysing BT5- Evaluating BT6- Creating.

Course outcomes (CO's): C01- The concepts of Role of Mechanical Engineering and Energy sources.

C02 - The Machine Tool Operations and advanced Manufacturing process.

CITY ENGINEERING COLLEGE
DEPARTMENT OF Mechanical Engineering

SCHEME FOR VALUATION

Semester & Section: 1st 'B'

Internal Test 01

Date: 3/2/23

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<u>PART-A:-</u>		
	(a) any 2 points b/w CES vs NCS (b) Explan of any 2 sectors in Mech. Engg	02x2=04 04x1=04	04 04 } 08.
2.	(OR)		
	Sketch Explan	04 04	08.
3.	<u>PART-B:-</u>		
	Construction of Lathe Working of Lathe	04 04	08.
4.	(OR)		
	any 2 M/c's operations on Lathe Sketch Explan	02x02=04 02x02=04	08.
5.	<u>PART-C:-</u>		
	Construction of Milling M/c Working of Milling M/c	04 04	08.
6.	(OR)		
	any 2 M/c's operations on Milling M/c — Sketch — Explan	02x02=04 02x02=04	08.
7.	<u>PART-D:-</u>		
	Sketch Explan	04 04	08.

[Handwritten signature]

S. Karthika

Question No.	Details of the Answer	Marks Distribution	Total Marks
8.	<p style="text-align: center;">(OR)</p> Components of CNC M/C. - sketch Advantages of CNC M/C. - any 3 points Disadvantages of CNC M/C. - any 3 points	02 03x2=06 03x1=03	08.
9.	<p style="text-align: center;"><u>PART-E:-</u></p> Defn Solar Cell } Sketch Explan	02 03 03	08.
10.	<p style="text-align: center;">(OR)</p> Wind Mill } Sketch Explan	04 04	08.

Z. K. B. S.

USN

--	--	--	--	--	--	--	--	--	--

COURSE CODE: 22ESC144

CITY
ENGINEERING COLLEGE
SECOND INTERNAL TEST

PROGRAMME: IS, AI & ML

COURSE NAME: INTRODUCTION TO MECHANICAL ENGG

DATE: 03/03/2023

SEM: 1ST 'A' & 'B'

TIME: 10:30AM – 12:00PM

Duration: 1.30 Hrs

MAX MARKS: 40

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.		M	CO'S	BT'S
PART - A				
1.	With the help of P-V diagram, explain the working of 4-Stroke Petrol engine.	08	C03	BT2 BT3
OR				
2.	With the help of P-V diagram, explain the working of 4-Stroke Diesel engine.	08	C03	BT2 BT3
PART - B				
3.	With a neat sketch explain the process of Arc welding.	08	C03	BT2 BT3
OR				
4.	What is gas welding? With a neat sketch explain the principle of operation of Oxy-Acetylene Gas welding.	08	C03	BT2 BT3
PART-C				
5.	Discuss the need of Electric and Hybrid vehicles.	08	C03	BT2 BT3
OR				
6.	Explain IC Engine terminologies along with sketch.	08	C03	BT2 BT3
PART-D				
7.	Write the Differences between SI v/s CI engine.	08	C03	BT2 BT3
OR				
8.	List the advantages & disadvantages of Electric Vehicles & Hybrid Vehicles.	08	C03	BT2 BT3
PART-E				
9.	Enumerate the differences between Soldering, Brazing & Welding.	08	C03	BT2 BT3
OR				
10.	With the help of line diagram describe the working principle of Electric vehicle.	08	C03	BT2 BT3

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analyzing BT5- Evaluating BT6- Creating.

Course outcomes (CO's): C03: Discuss the construction and application of IC Engines, Refrigerators and Air-conditioners and analyze their performance

CITY ENGINEERING COLLEGE
DEPARTMENT OF Mechanical Engineering

SCHEME FOR VALUATION

Semester & Section: 1st 'B' Internal Test 02

Date: 02/03/2022

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<u>PART-A:-</u> P-V diagram of 4-S Petrol Engine Working	04 04	08.
2.	<u>OR</u> P-V diagram of 4-S Diesel Engine Working	04 04	08.
3.	<u>PART-B:-</u> Arc welding $\left\{ \begin{array}{l} \text{Sketch} \\ \text{Explan} \end{array} \right.$	04 04	08.
4.	<u>OR</u> Defn Oxy-Acetylene gas welding $\left\{ \begin{array}{l} \text{Sketch} \\ \text{Explan.} \end{array} \right.$	02 03 03	08.
5.	<u>PART-C:-</u> Need of El. vehicles. $\left\{ \begin{array}{l} \text{Explan any } 4 \text{ points} \\ \text{Hybrid vehicles } \end{array} \right.$ Each	04 x 1 = 04 04 x 1 = 04	08.
6.	<u>OR</u> SI Vs CI engine any 8 points Each.	08 x 1 = 08	08.
	<u>PART-D:-</u>		

SPM

S. Karanas

Question No.	Details of the Answer	Marks Distribution	Total Marks
7.	I. C Engine terminal test Expln any 4 parts Sketch.	04 04	08.
8.	ET. velocity Hybrid vehicles <div style="margin-left: 20px;"> $\left\{ \begin{array}{l} \text{ADV} \\ \text{Disadv} \end{array} \right.$ any 2 points $\left\{ \begin{array}{l} \text{ADV} \\ \text{Disadv} \end{array} \right.$ any 2 points </div>	02x1=02 02x1=02 02x1=02 02x1=02	08.
<u>PART-E</u>			
9.	Soldering vs Welding vs Brazing any 6 points	08	08.
OR			
10.	Line diagram of ET. vehicle Walking	04 04	08.

Z. Karan

USN

COURSE CODE: 22ESC144

--	--	--	--	--	--	--	--	--	--

CITY
ENGINEERING COLLEGE
THIRD INTERNAL TEST

PROGRAMME: IS, AI & ML

DATE: 06/04/2023

COURSE NAME: INTRODUCTION TO MECHANICAL ENGG

TIME: 10:30AM – 12:00PM

SEM: 1ST 'A' & 'B'

Duration: 1.30 Hrs

MAX MARKS: 40

Note: Answer any FIVE questions choosing at least one from each Part.

Q no.	PART – A	M	CO'S	BT'S
1.	Explain with a neat sketch the configuration of Cartesian Robot, list its advantages, disadvantages and applications.	08	C03	BT2 BT3
OR				
2.	Explain with a neat sketch the configuration of Polar Robot, list its advantages, disadvantages and applications.	08	C03	BT2 BT3
PART – B				
3.	With a Suitable Example explain the concept of open and Closed loop System.	08	C03	BT2 BT3
OR				
4.	With suitable sketches explain the different types of joints used in robots.	08	C03	BT2 BT3
PART-C				
5.	Explain the Industrial application of robots specific to (i) material handling and (ii) Assembly & inspection.	08	C03	BT2 BT3
OR				
6.	Classify ferrous & non-ferrous materials. Explain the concept of Shape memory Alloys, along with its applications.	08	C03	BT2 BT3
PART-D				
7.	With a block diagram explain the basic elements in automation system.	08	C03	BT2 BT3
OR				
8.	Explain the basic types of automation in industry.	08	C03	BT2 BT3
PART-E				
9.	With a block diagram explain the functional blocks in IOT.	08	C03	BT2 BT3
OR				
10.	With a block diagram explain any two communication models in IOT.	08	C03	BT2 BT3

Blooms Taxonomy Levels (BTL)

BT1- Remembering BT2- Understanding BT3 – Applying BT4 – Analyzing BT5- Evaluating BT6- Creating.

Course outcomes (CO's): C03: Discuss the construction and application of IC Engines, Refrigerators and Air-conditioners and analyze their performance

CITY ENGINEERING COLLEGE
DEPARTMENT OF Mechanical Engineering

SCHEME FOR VALUATION

Internal Test 03

Semester & Section: Ist 'B'

Date: 06/04/2023

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<u>PART A:-</u> Sketch Ex plan Advantages - ② points Each Disadvantages - any ② points Each Applications. - any ① point. ⓄR	01 02 02x1=02 02x1=02 01	08.
2.	Sketch Ex plan Advantages - any ② points Each Disadvantages - any ② points Each Applications - any ① point. <u>PART-B:-</u>	01 02 02x1=02 02x1=02 01	08.
3.	Explan of open loop sys Explan of closed loop sys. ⓄL	04 04	08.
4.	Sketching - any ④ Joints Ex plan	04x1=04 04x1=04	08.
5.	<u>PART-C:-</u> Explan ← Material Handling Assembly & Inspection.	04 04	08.

[Handwritten Signature]

S. Karthikeyan

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	<p style="text-align: center;">(OR)</p> Classification Explan. Applications.	02 04 02	08.
7.	<p style="text-align: center;"><u>PART-Ds-</u></p> Block diagram Explan.	04 04	08.
8.	<p style="text-align: center;">(OR)</p> Explan of any 2 types each	04x2=08	08.
9.	<p style="text-align: center;"><u>PART-ES-</u></p> Block diagram Explan	04 04	08.
10.	<p style="text-align: center;">(OR)</p> Block diagram any 2 models in TOT.	04 2x2=04	08.

Z. K. ...

Name of the Teacher : HARSHA VARDHAN U.
 Designation : Assistant Professor
 Department : Mechanical Engineering

Sem/ Branch	Subject Code	Subject
1. <u>Ist / I.S.</u>	<u>22ESC144</u>	<u>Introduction to Mechanical Engg.</u>
2. ....	.....	.....
3. ....	.....	.....

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff				
HOD	<u>S. Karthika</u>	<u>S. Karthika</u>	<u>S. Karthika</u>	<u>S. Karthika</u>
Principal				

ATTENDANCE

ASSESSMENT

Sl. No.	Reg.No.	Name	15/11	16/11	17/11	22/11	24/11	29/11	21/11	2/12	5/12	7/12	9/12	12/12	16/12	19/12	% of Attendance	Test Marks					Sessional Marks	Remarks
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		1	2	3	IA (30)	Assn (20)		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		150	150	150	250	250		
1	1CE22IS001	Abhishek Bajoral	1	2	3	4	5	6	7	7	8	9	10	11	12	12	88%	25	24	19	17	17	34	
2	1CE22IS002	Adithya V. Reshmeshetty	1	2	3	4	5	6	6	7	8	9	10	11	12	13	88%	12	22	14	12	18	30	
3	1CE22IS003	Amasaguddada Vinayaka	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	23	32	29	21	19	40	
4	1CE22IS004	Anitha Rani S.	1	2	3	4	5	6	7	7	8	9	10	11	12	13	95%	22	36	16	19	19	38	
5	1CE22IS005	Ashwini G.H.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	95%	27	39	25	23	19	42	
6	1CE22IS006	B. Durga Varshini	1	2	3	4	5	6	7	8	9	9	10	11	12	13	95%	19	28	16	16	19	35	
7	1CE22IS007	Battula Vamsi Krishna Reddy	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	17	31	06	14	18	32	
8	1CE22IS008	Bharath H.D	1	2	3	4	5	6	7	8	9	10	11	12	13	13	95%	16	33	09	15	19	34	
9	1CE22IS009	Chaluvasaaju	1	2	3	4	5	6	7	8	9	10	11	12	13	14	95%	23	27	36	22	18	40	
10	1CE22IS010	Chethan Abhishek K.M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	27	38	23	22	18	40	
11	1CE22IS011	Divya M.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	28	35	34	24	20	44	
12	1CE22IS012	Divyashree H.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	30	37	37	26	20	46	
13	1CE22IS013	Dolly Pabli	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	27	38	26	23	20	43	
14	1CE22IS014	Dushyanth	1	1	2	3	4	5	6	7	8	9	10	11	12	13	88%	0	20	30	13	15	28	
15	1CE22IS015	Eshwar M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	93%	21	39	35	24	18	42	
16	1CE22IS016	G. Subhas Raj	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	39	40	38	29	20	49	
17	1CE22IS017	Guluprand E.	1	1	2	3	3	4	5	6	7	8	9	10	11	12	88%	02	35	20	14	16	30	
18	1CE22IS018	Harshitha D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	31	40	40	28	19	47	
19	1CE22IS019	Harshitha M.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	26	34	26	22	18	40	
20	1CE22IS020	Harshitha S.															9	-	-	-	-	-	-	
21	1CE22IS021	Jeevika K.	1	2	3	4	5	5	6	7	8	9	10	11	12	13	95%	09	26	30	16	18	34	
22	1CE22IS022	Jyothi Kumali	1	2	3	4	5	6	7	8	9	9	10	11	12	13	98%	23	39	32	24	19	43	
23	1CE22IS023	Karishma K.	1	2	3	4	5	6	7	8	9	10	11	11	12	13	98%	28	37	25	23	19	42	
24	1CE22IS024	Kaushik B.H.	1	2	3	4	5	6	7	7	8	9	10	11	12	13	95%	30	35	22	22	19	41	
25	1CE22IS025	Khatija Tul Kubra	1	1	2	3	4	4	5	6	7	8	9	10	14	12	90%	27	38	19	21	18	39	
	No. of Abs.																							
	Initials		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

ATTENDANCE

Sl. No.	Reg.No.	Name	15/11	16/11	17/11	18/11	19/11	20/11	21/11	22/11	23/11	24/11	25/11	26/11	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	13/12	14/12		
			4	2	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
26	1CE22IS026	Kusuma. R.	1	1	2	3	4	5	6	7	8	9	10	11	11	12																		
27	1CE22IS028	Manoj Kumar. S.	1	2	3	4	4	5	6	7	8	9	10	11	12	13																		
28	1CE22IS029	Manvitha. H.M.	1	2	2	3	4	5	6	7	8	9	10	11	12	13																		
29	1CE22IS030	Mithun. Y.	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
30	1CE22IS031	Mohammed Arman Ali	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
31	1CE22IS033	Mudula. J.	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
32	1CE22IS034	Nand Kishor Malaviya	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
33	1CE22IS032	Padma Kumar. M.	1	2	3	4	5	6	7	8	9	10	10	11	12	13																		
34	1CE22IS035	Pragna. N.	1	2	3	4	5	6	7	8	9	10	11	12	13	13																		
35	1CE22IS036	Pramod. C. Dhotarad	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
36	1CE22IS038	R. Kaviya	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
37	1CE22IS039	Rahul. S.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
38	1CE22IS040	Rakshitha. E.	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
39	1CE22IS042	Rashi. T.M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
40	1CE22IS043	Raviprakash. S. Tahasheldas	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
41	1CE22IS044	Sages. R.	1	2	3	4	5	5	6	7	7	8	9	10	11	12																		
42	1CE22IS045	Sahana. G	1	2	3	4	5	6	7	7	8	9	10	11	12	13																		
43	1CE22IS046	Sahana Rao	1	2	3	4	5	6	7	8	9	9	10	11	12	13																		
44	1CE22IS047	Sandhya. M.O.	1	1	2	3	4	5	6	7	8	8	9	10	11	12																		
45	1CE22IS048	Sanvi. B. J.	1	2	3	4	5	6	7	8	9	10	10	11	12	13																		
46	1CE22IS049	Sathyadli. S.	1	1	2	3	4	5	6	7	8	9	10	11	11	12																		
47	1CE22IS050	Satya Narayana Menda. A.	1	1	2	3	4	5	6	7	8	9	10	10	11	12																		
48	1CE22IS051	Shashank. H.C.	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
49	1CE22IS052	Sini Prakash Bhat	1	2	3	4	5	6	7	8	9	10	11	12	13	14																		
50	1CE22IS053	Srikanth. K.P.	1	2	3	4	5	5	6	7	8	9	10	11	12	13																		
	No. of Abs.																																	
	Initials																																	

ASSESSMENT

% of Attendance	Test Marks					Sessional Marks (25)	Remarks
	1	2	3	T.A (30)	Assn (20)		
	/50	/50	/50				
93%	19	32	23	19	19	38	
93%	07	11	28	12	18	30	
93%	11	29	33	18	18	36	
98%	39	40	28	27	20	47	
98%	36	40	38	29	20	49	
98%	27	39	32	25	20	45	
98%	25	34	36	24	20	44	
93%	20	22	21	13	18	31	
93%	13	23	26	16	19	35	
93%	25	27	27	20	19	39	
98%	36	40	30	27	20	47	
98%	28	38	28	24	19	43	
98%	31	40	32	26	20	46	
98%	26	39	33	25	18	43	
95%	20	38	32	23	19	42	
95%	32	35	21	22	19	41	
95%	39	40	32	28	20	48	
95%	24	38	26	22	18	40	
95%	14	31	28	18	19	37	
90%	23	31	22	19	17	36	
90%	23	29	11	16	19	35	
85%	17	18	17	13	14	27	
98%	25	26	19	18	19	37	
90%	21	21	21	16	19	35	
95%	28	37	33	25	18	43	

SESSMENT

Sl. No.	Reg.No.	Name	15/11	17/11	19/11	22/11	26/11	29/11	30/11	2/12	5/12	7/12	9/12	12/12	16/12	19/12	% of Attendance	Test Marks					Sessional Marks	Remarks
			1	2	3	4	5	6	7	1	2	3	I.A	Asses	250									
			1	2	3	4	5	6	7	8	9	10	11	12		13		14	150	150	150	(30)			(20)
51	1CE22IS054	Spoorthi. S. Raa	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	31	40	32	26	20	46	
52	1CE22IS055	Tarun. M.	1	2	3	4	5	6	7	7	8	9	10	11	11	12	90%	23	25	15	16	18	34	
53		Thiruvith Kumar N.																						
54	1CE22IS056	Velanki Venkatesh	1	1	2	3	4	5	6	7	8	9	10	10	11	12	88%	0	16	32	12	18	30	
55	1CE22IS057	Vignesh Kumar D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	32	31	29	23	20	43	
56	1CE22IS058	Vishnu Shobhan. S.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	30	40	37	27	20	47	
57	1CE22IS059	Y. Anil Kumar	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	25	39	29	23	18	41	
58	1CE22IS060	Yashaswini. N.M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	98%	22	30	19	18	20	38	
59	1CE22IS061	Yashwanth Gowda. B.T.	1	2	3	4	5	6	7	8	9	10	11	11	12	13	90%	16	36	1	13	18	31	
60	1CE22IS041	Ranjith Gowda. S.	1	2	3	4	5	6	7	8	8	9	10	11	12	12	90%	15	21	11	12	18	30	
61	1CE22IS068	H. K. Bharath.	1	2	3	4	5	6	7	7	8	9	10	11	12	12	88%	02	17	30	12	18	30	
62	1CE22IS057	Pratheek. K.N.	1	2	3	4	5	6	7	8	9	9	10	11	12	13	90%	07	15	30	13	17	30	
63		Yashwanth. F.J.																						
64	1CE22IS062	Mohammed Zaid	1	2	3	4	4	5	6	7	8	9	10	11	12	13	95%	33	36	27	24	18	42	
65																								
66																								
67																								
68																								
69																								
70																								
71																								
72																								
73																								
74																								
75																								
	No. of Abs.																							
	Initials																							

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30