HANDOUT

First Year ECE Semester I

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

HANDOUT- INDEX

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SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, Affiliated to JNTUH)
Sheriguda (V), Ibrahimpatnam (M), R.R. Dist-501510

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

INSTITUTION VISION

To be a premier Institution in Engineering & Technology and Management with competency, values and social consciousness

INSTITUTION MISSION

IM₁   Provide high quality academic programs, training activities and research facilities.

IM₂   Promote Continuous Industry-Institute interaction for employability, Entrepreneurship, leadership and research aptitude amongstakeholders.

IM₃   Contribute to the economical and technological development of the region, state and nation.

DEPARTMENT VISION

To be a centre of excellence in Electronics and Communication Engineering Education to produce professionals for ever-growing needs of society.

DEPARTMENT MISSION

The Department has following Missions:

DM1: To promote and facilitate student- centric learning.

DM2: To involve in activities that enable overall development of stakeholders.

DM3: To provide holistic environment with state-of-art facilities for students to develop solutions for various social needs.

DM4: Organize trainings in embedded systems with Industry interaction.

PROGRAM EDUCATIONAL OBJECTIVES(PEO'S)

PEO	Statements
PEO1	complish technical proficiency for the efficaciousECE Professional.
PEO2	rsue higher studies with emphasizing design, test and development of the systems to meet the industry and societal needs.
PEO3	Become entrepreneur by practicing ethics, professional integrity and leadership qualities.

PROGRAM SPECIFIC OUTCOMES(PSO'S)

PSO1:	To nurture and empower the SICET-ECE students strong in practical, technical and research domains in the areas of Signal/Image processing, VLSI and wireless Communication.
PSO 1:	To design and developa prototype system that will incorporate user requirements using modern devices and emerging technology for industry automations.
PSO 3:	To make the SICET-ECE students as successful **industry ready engineers** by imparting essential **interpersonal skillsand widespread exposure** on multi-disciplinary technologies.

PROGRAM OUTCOMES (PO'S)

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.

COs MAPPING WITH POs & PSOs

Course Name: Mathematics-I(LINEAR ALGEBRA AND CALCULUS) R20MTH1101

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

Course Outcomes	Statements
C111.1	Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations (K4-Analyse)
C111.2	Reduce the quadratic form to canonical form using orthogonal transformations (K3-Apply)
C111.3	Analyse the nature of sequence and series (K4-Analyse)
C111.4	Solve the applications on mean value theorems (K3-Apply)
C111.5	Evaluate the improper integrals using Beta and Gamma functions (K5-Evaluate)
C111.6	Find the extreme values of functions of two variables with / without constraints (K3-Apply)

Course :Articulation Matrix

CO	Levels of CO	Program Outcomes												Program Specific Outcomes			
		K3	K4	K4	K5	K3,K5,K6	A3	A2	A3	A3	A3	A3	A2	K3	K5	K3	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
C111.1	K4	2	3	3	1	-	-	-	-	-	-	-	2	2	2	2	1.13
C111.2	K3	3	2	2	1	-	-	-	-	-	-	-	1	3	2	3	1.13
C111.3	K4	1	3	3	2	-	-	-	-	-	-	-	1	2	2	1	1
C111.4	K3	3	2	1	1	-	-	-	-	-	-	-	1	3	2	3	1.07
C111.5	K5	1	2	2	3	-	-	-	-	-	-	-	2	2	2	1	1
C111.6	K3	3	2	2	2	-	-	-	-	-	-	-	1	3	2	3	1.2
C111		2.17	2.33	2.17	1.67								1.33	2.5	2	2.17	1.09

(R20EAP1101) APPLIED PHYSICS

Course outcomes	Statements
C112.1	The concepts would be able to learn the fundamental concepts on Quantum behavior of matter in its micro state (K3-Applying).
C112.2	The knowledge of fundamentals of the semiconductors, semiconductor diodes and transistors.(K3-Applying).
C112.3	Analyzing the principle and working of various optoelectronic devices like solar cell, photo diode, etc(K4-Analyzing).
C112.4	Study about characteristics of lasers and transmission of signal in optical fiber. (K4-Analyzing).

C112.5	Evaluate the polarization phenomenon in dielectrics and magnetization in magnetic materials and principles of electromagnetism.(K5 -Evaluating).
C112.6	Able to Design and characterize to study the properties of materials help to prepare new
	materials for engineering applications(K6-Creating).

CO	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C112.1	3	1	1	1	1	-	2	-	-	-	-	1	1	2	3
C112.2	2	2	2	1	2	-	2	-	-	-	-	2	1	2	1
C112.3	1	3	3	3	1	-	2	-	-	-	-	2	1	2	1
C112.4	1	3	3	3	1	-	2	-	-	-	-	2	1	1	-
C112.5	1	1	2	1	2	-	2	-	-	-	-	1	1	1	1
C112.6	1	2	2	2	2	-	2	-	-	-	-	1	1	3	1
C112	1.5	2	2.1	1.8	1.5	-	2	-	-	-	-	1.5	1	1.8	1.1

PROGRAMMING FOR PROBLEM SOLVING (R20CSE1101)

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

C113.1	To write algorithms and to draw flowcharts for solving problems.(k6-create)
C113.2	To convert the algorithms/flowcharts to C programs.(K3-Apply)
C113.3	code and test a given logic in C programming language. (K4-Analyze)
C113.4	To decompose a problem into functions and to develop modular reusable code. (K4-Analyze)
C113.5	To use arrays, pointers, strings and structures to write C programs. (K3-Apply)
C113.6	Searching and Sorting problems (k3-Apply)

Course Articulation Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C113.1	1	2	2	-	1	-	-	-	2	-	-	-	2	1	-
C113.2	2	1	2	1	3	-	-	-	-	-	-	-	1	-	-
C113.3	3	2	3	-	3	-	-	-	-	-	-	-	2	-	2
C113.4	2	-	2	2	3	-	-	-	2	-	-	-	-	2	2
C113.5	1	2	2	2	3	-	-	-	2	-	-	-	-	2	2
C113.6	2	1	2	2	3	-	-	-	-	-	-	-	2	1	1
C113	**2**	**1.3**	**2.1**	**1.1**	**2.6**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**1.5**	**1**	**1.5**

Engineering Graphics R20MED1102

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

Course Outcomes (COs)	
C114.1	Acquire requisite basic knowledge, techniques for the study of engineering graphics.K4 Analyze)
C114.2	Comprehend the basics of orthographic projections and deduce orthographic projections of a points, lines and planes at different orientations. (K3-Applying)
C114.3	Imagine orthographic views of various solid objects at different orientations..(K5 -Evaluating).
C114.4	Understanding the meaning of sectioning and to analyses the internaldetails of solids(K3-Applying)
C114.5	Develop the surfaces and Intersection of right regular solids.K4 Analyze)
C114.6	Recognize the significance of isometric and perspective views to relate 2D with 3D and to create 2D sketches by Auto CAD package.K5

Course Articulation Matrix

CO	Levels of CO	Program Outcomes												Program Specific Outcomes			
		K3	K4	K4	K5	K3,K5,K6	A3	A2	A3	A3	A3	A3	A2	K3	K6	K3	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO-1	K4	3	2	3	-	3	-	-	-	-	-	-	3	3	3	2	1.46
CO-2	K3	3	2	3	-	3	-	-	-	-	-	-	3	3	3	2	1.46
CO-3	K5	3	2	3	-	3	-	-	-	-	-	-	3	3	3	2	1.46
CO-4	K3	3	2	3	-	3	-	-	-	-	-	-	3	3	3	2	1.46
CO-5	K4	3	2	3	-	3	-	-	-	-	-	-	3	3	3	2	1.46
CO-6	K5	3	2	3	-	3	-	-	-	-	-	-	3	3	3	2	1.46
		3	2	3		3							3	3	3	2	

(R20EAP12L1) APPLIED PHYSICS LAB

Course Outcomes	Statements
C125.1	nderstand Voltage – Current characteristics semiconductor devices and opto electronic devices. (K2-Understanding)
C125.2	timated how the light energy converts into electrical energy by using photo diodes. K4-Analyzing)
C125.3	e nature of the semiconducting material can be identified by evaluating hall coefficient. 4- Analyzing)
C125.4	arn the practical knowledge in quantum concepts by photo electric effect experiment and Characteristics of Laser diode. (K3-Applying)

C125.5	alyze the magnetization and demagnetization of a magnetic material. (K4-Analyzing)
C125.6	lculate the Numerical aperture of an optical fiber. (K3-Applying)

Course Articulation Matrix

CO	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C125.1	3	2	2	3	3	-	1	-	-	-	-	2	2	1	-
C125.2	3	3	2	2	3	-	-	-	-	-	-	2	2	1	-
C125.3	3	2	2	3	3	-	3	-	-	-	-	2	2	2	-
C125.4	3	3	3	3	3	-	-	-	-	-	-	2	2	2	-
C125.5	3	2	2	3	3	-	1	-	-	-	-	2	2	2	-
C125.6	3	3	2	3	3	-	2	-	-	-	-	2	2	1	-
C125	3	2.5	2.1	2.8	3	-	1.1	-	-	-	-	2	2	1.5	-

(R20CSE11L2) PROGRAMMING FOR PROBLEM SOLVING LAB

Course Outcomes	Statements
C126.1	Formulate algorithms/flowcharts there by translating them into programs using variables with various data types , looping and selection statements. (K6-create)
C126.2	Implement logic building techniques using control statements and arrays (K3-apply)
C126.3	Construct modular and structure programming using functions, strings and structures.(K3-Apply)
C126.4	Analyze the iteration with recursion and implementation macros . (K4-Analyze)
C126.5	Illustration of pointers and implement memory management techniques and file handling approach. (K4-Analyze)
C126.6	Implement search and sort operations on arrays.(K3-Apply)

MAPPING WITH POs & PSOs

CO's	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C116.1	2	2	2	-	3	-	-	-	1	-	-	-	2	2	1
C116.2	1	2	2	-	3	-	-	-	-	-	-	-	2	2	1

C116.3	1	2	2	1	3	-	-	-	1	-	-	-	2	2	1
C116.4	1	2	2	1	3	-	-	-	-	-	-	-	1	1	1
C116.5	1	2	2	1	3	-	-	-	-	-	-	-	2	2	1
C116.6	1	2	2	1	3	-	-	-	-	-	-	-	2	1	1
C116	1.16	2	2	0.66	3				0.33				1.83	1.66	1

Course Name: Environmental Science (R20HAS1102)

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

Course Outcomes	Statements
C119.1	Discover knowledge in ecological perspective and value of environment.
C119.2	Understand the significance of various natural resources and its management.
C119.3	Demonstrateacomprehensiveunderstandingoftheworld'sbiodiversityandtheimportanceofitsconservation.
C119.4	Categorize different types of pollutions and their control measures, Analyze global environmental problems and come out with best possible solutions.K4APPLYING
C119.5	Discover effective methods of waste management, Understand environmental laws and sustainable development.K2

Course: Articulation Matrix

Course Outcomes	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C119.1	3	2	2	-	-	-	3	2	-	-	-	-	2	2	-
C119.2	2	3	3	-	-	-	3	2	-	-	-	-	2	2	-
C119.3	2	2	2	-	-	-	2	3	-	-	-	-	2	3	-
C119.4	2	2	2	-	-	-	3	2	-	-	-	-	3	2	-
C119.5	2	3	3	-	-	-	2	3	-	-	-	-	1	2	-
C119	2.2	2.4	2.4	-	-	-	2.6	2.4	-	-	-	-	2.0	2.2	-

ABR 2O

DR.NO.WIC T/AUTO/DAE/BR 2o/zc oEulc cv/ 200/20eo

DATE: 24.1 1.2020

DrG.SURESH,
Principal,

All the HODs

Sir,

Sub: SICET(Autonomous) - Academic & Evaluation - Academic Calendar for
I B.Tech - 1 4s II Se mester for the academic year 2020-21 - Reg.

The approved Academic Calendar for I B.Tech — 1 8s II Semester for the academic year
2020-2 1 is given below:

ACADEMIC CALENDAR - I B.TECH - I & II SEMESTER
noMITTED BATCH - 2020-2021 of BR-20 Re gulation

ISEMESTER

SNO	EVENT	PERIOD	DURATION
1.	Induction & Orientation Programme	01. **12.2020**	
2.	1*' Spell of Instructions for covering First Two and a half Units	0 1. 12.2020 23.0 1.202 1	8 Weeks
3.	I Mid Examinations	25.01.202 1 — 30.0 1.202 1	1 Week
4.	2 " Spell of Instructions for covering Remaining Two and a half Units	01 .02. 202 1 — 27.03.2021	8 Weeks
5.	II Mid Examination s	29.03.2021 — 06. 04. 202 1	1 Week
6.	Preparation & Practical Examinations	07. 04. 202 I — 12.04. 202 1	1 Week
7.	I Semester End Examinations (Regular)	15.04. 202 1 — 29.0A.202 1	2 Weeks
8.	Supplementary Hxarr+ina tions for I Semester ABR- 12, BR 14, BR- 16 & BR- 18 Regulations)	15.04. 202 1 — 29.04. 2021	2 Weeks
9.	Supplementary Examinations for II Semester {BR 12, BR- 14, BR- 16 & BR- 18 Regulations)	30.04. 202 1 — 12.05.202 1	2 Weeks

Commencement of **Class-Work for I B.Tech - II Semester** 30.04.202 1

II SEMESTER

8*	EVENT	PERIOD	DURATION
1.	Commencement of II Sem Class Work	**30.04.202** I	
2.	1st Spell of Instructions for covering First T\vo and a half Units	30.04.202 I — 24. 06. 202 1	8 Weeks
3.	I Mid Examinations	25.06.202 1 — 30. 06. 2 02 1	1 Week
	" "r covering Remaining 2 d nd a hal ni s "	.07. 202 1 — 25. 08.2021	8 Weerrs
5.	II Mid Examinations	26.08.2021 — 01.09.2021	1 Week
6.	Preparation & Practical Examinations	02.09.2021 — 08.09.2021	1 Week
7.	II 8erriester End Examinations (Regular/ Suppl.)	09.09.2021 — 22.09.202 1	2 Weeks
8.	Supplementary Examinations for I Semester (BR- 12, BR- 14, BR- 16 & BR- 18 Regulations)	23.09. 202 1 — OC›. 10.202 1	2 Weeks

Commencement of Class Work for II B.Tech — I Semester - 20. 10.2021

Note: Until further instructions online classes will be continued.

ACE

CE 25/11/2020

DEAN

PRINCIPAL

SRI INDU COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
DEPARTMENT OF HUMANITIES & SCIENCES

DEPARTMENT CALENDAR – 2021-2022 (I B.Tech – I SEMESTER)

DAYS	NOV		DEC		JAN		FEB		MAR		APRIL - 22	
FRIDAY					JANUARY -22						1	MID II EXAM
SATURDAY					1	NEW YEAR					2	UGADI
SUNDAY	NOVEMBER -21				2	HOLIDAY					3	HOLIDAY
MONDAY	1				3		FEBRUARY - 22		MARCH - 22		4	
TUESDAY	2		DECEMBER - 21		4		1		1	MAHA SHIVARATRI	5	PREPARATION & LAB END EXAMINATIONS
WEDNESDAY	3		1		5		2		2		6	
THURSDAY	4		2		6		3		3		7	
FRIDAY	5		3		7		4		4		8	
SATURDAY	6		4		8		5	SUBMISSION OF MID I MARKS	5		9	SUBMISSION OF MID II MARKS
SUNDAY	7	HOLIDAY	5	HOLIDAY	9	HOLIDAY	6	HOLIDAY	6	HOLIDAY	10	HOLIDAY
MONDAY	8		6		10		7		7		11	
TUESDAY	9		7		11		8		8		12	
WEDNESDAY	10		8		12		9		9		13	I SEMESTER END EXAMINATIONS
THURSDAY	11		9		13	HOLIDAY	10		10		14	
FRIDAY	12		10		14	BHOGI	11		11		15	
SATURDAY	13		11		15	PONGAL	12		12		16	
SUNDAY	14	HOLIDAY	12	HOLIDAY	16	HOLIDAY	13	HOLIDAY	13	HOLIDAY	17	HOLIDAY
MONDAY	15		13		17		14		14		18	
TUESDAY	16		14		18		15		15		19	
WEDNESDAY	17		15		19		16		16		20	
THURSDAY	18		16		20		17		17	HOLI	21	I SEMESTER END EXAMINATIONS
FRIDAY	19		17		21		18		18		22	
SATURDAY	20		18		22		19		19		23	
SUNDAY	21	HOLIDAY	19	HOLIDAY	23	HOLIDAY	20	HOLIDAY	20	HOLIDAY	24	HOLIDAY
MONDAY	22		20		24	MID I EXAM	21		21		25	COMMENCEMENT OF II SEMESTER CLASSES
TUESDAY	23		21		25	MID I EXAM	22		22		26	
WEDNESDAY	24		22		26	REPUBLIC DAY	23		23		27	
THURSDAY	25	INDUCTION & ORIENTATION PROGRAM	23		27	MID I EXAM	24		24		28	
FRIDAY	26		24		28	MID I EXAM	25		25		29	
SATURDAY	27		25	X-MAS	29	MID I EXAM	26		26		30	
SUNDAY	28	HOLIDAY	26	HOLIDAY	30	HOLIDAY	27	HOLIDAY	27	HOLIDAY		
MONDAY	29		27		31		28		28			
TUESDAY	30		28						29			
WEDNESDAY			29						30	MID II EXAM		
THURSDAY			30						31	MID II EXAM		
FRIDAY			31									

Mathematics-I

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)

B.Tech. - I Year – I Semester

	L	T	P	C
	3	1	0	4

(R20MTH1101) Mathematics – I
(Linear Algebra and Calculus)

Course Objectives: To learn

- Types of matrices and their properties.
- Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
- Concept of Eigen values and eigenvectors and to reduce the quadratic form to canonical form.
- Concept of Sequence.
- Concept of nature of the series.
- Geometrical approach to the mean value theorems and their application to the mathematical problems
- Evaluation of surface areas and volumes of revolutions of curves.
- Evaluation of improper integrals using Beta and Gamma functions.
- Partial differentiation, concept of total derivative
- Finding maxima and minima of function of two and three variables.

Course Outcomes: After learning the contents of this paper the student must be able to

- Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
- Find the Eigen values and Eigen vectors
- Reduce the quadratic form to canonical form using orthogonal transformations.
- Analyse the nature of sequence and series.
- Solve the applications on the mean value theorems.
- Evaluate the improper integrals using Beta and Gamma functions
- Find the extreme values of functions of two variables with/ without constraints.

UNIT-I: Matrices

Matrices: Types of Matrices, Symmetric; Hermitian; Skew-symmetric; Skew-Hermitian; orthogonal matrices; Unitary Matrices; rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; solving system of Homogeneous and Non-Homogeneous equations. Gauss elimination method; Gauss Seidel Iteration Method.

UNIT-II: Eigen values and Eigen vectors

Linear Transformation and Orthogonal Transformation: Eigen values and Eigenvectors and their properties: Diagonalization of a matrix; Cayley-Hamilton Theorem (without proof); finding inverse and power of a matrix by Cayley-Hamilton Theorem; Quadratic forms and Nature of the Quadratic Forms; Reduction of Quadratic form to canonical forms by Orthogonal Transformation

UNIT-III: Sequences & Series

Sequence: Definition of a Sequence, limit; Convergent, Divergent and Oscillatory sequences. Series: Convergent, Divergent and Oscillatory Series; Series of positive terms; Comparison test, p-test, D-Alembert's ratio test; Raabe's test; Cauchy's Integral test; Cauchy's root test; logarithmic test. Alternating series: Leibnitz test; Alternating Convergent series: Absolute and Conditionally Convergence.

UNIT-IV: Calculus

Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem. Taylor's Series. Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates), Definition of Improper Integral: Beta and Gamma functions and their applications.

UNIT-V: Multivariable calculus (Partial Differentiation and applications)

Definitions of Limit and continuity.
Partial Differentiation; Euler's Theorem; Total derivative; Jacobian; Functional dependence, independence, Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

TEXTBOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.

REFERENCES:

- N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
- Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
- Engineering Mathematics by M.K.Jain, S.R.K. Iyengar, Narosa Publications

	SRI INDU COLLEGE OF ENGG & TECH		
	LESSON PLAN (Regulation :R20)		**Page: 1of 8**
	Department of		
	ELECTRONICS & COMMUNICATION ENGINEERING		
	Sub. Code & Title	(R20MTH1101) :MATHEMATICS-I(Linear Algebra & Calculus)	
	Academic Year:	**Year/Sem./Section**	**I / I / ECE**
	Faculty Name & Designation	**U ANURADHA** Assistant Professor	

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
	K1. Remembering K2. Understanding K3. Applying K4. Analyzing K5. Evaluating K6. Creating							
	UNIT – I							
I	**Matrices**					**13**		
1.1	Introduction of matrices	T2	465	465	Black board	02		CO1/K1
1.2	Definitions on Real matrices and their problems	T2	465	481	Black board	01		CO1/K2
1.3	Definitions on Complex matrices and their problems	T2	599	605	Black board	01		CO1/K2
1.5	Echelon form	R3	34	35	Black board	01		CO1/K5
1.6	Normal form	R3	46	46	Black board	01		CO1/K3
1.7	Gauss-Jordan method (To find the inverse of a matrix)	R3	76	78	Black board	01		CO1/K3
1.8	system of Homogeneous linear equations	R3	84	84	Black board	01		CO1/K2
1.9	system of Non-Homogeneous linear equations	R3	84	85	Black board	02		CO1/K2
1.10	Gauss elimination method	R3	136	137	Black board	01		CO1/K5
1.11	Gauss Seidel Iteration Method	R3	138	150	Black board	01		CO1/K5

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Unit/ Item No.		Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
	UNIT-II							
II	**Eigen values and Eigen vectors**					**16**		
2.1	Introduction of Linear Transformation and Orthogonal Transformation	T2	540	541	Black board	01		CO2/K2
2.2	Properties of Eigen values and Eigen vectors on Real matrices	T2	541	542	Black board	01		CO2/K2
2.3	Problems of Eigen values and Eigenvectors on Real matrices	T2	543	548	Black board	01		CO2/K5
2.4	Properties of Eigen values and Eigen vectors on Complex matrices	T2,W9	550	561	Black board	01		CO/K3
2.5	Problems of Eigen values and Eigenvectors on complex matrices	T2,W10	563	567	Black board	01		CO2/K5
2.6	Diagonalization by similarity transformation	T2	569	570	Black board	02		CO2/K1
2.7	Diagonalization by orthogonal transformation	R2	438	441	Black board	02		CO2/K1
2.8	Cayley-Hamilton Theorem	R2	430	431	Black board	01		CO2/K2
2.9	Inverse and power of a matrix by Cayley-Hamilton Theorem	R2	431	434	Black board	01		CO2/K3
2.10	Introduction of Quadratic forms	R2	435	438	Black board	01		CO2/K2
2.11	Reduction of Quadratic form to canonical forms by Linear Transformation	R2	441	443	Black board	02		CO2/K3
2.12	Reduction of Quadratic form to canonical forms by Orthogonal Transformation	R2	438	441	Black board	02		CO2/K3

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UNIT-III								
III	**Sequences & Series**					**11**		
3.1	Introduction of Sequences	R2	1.1	1.2	Black board	01		CO3/K1
3.2	Introduction of Series	R2	1.3	1.5	Black board	01		CO3/K1
3.3	p-test	R2	1.10	1.11	Black board	01		CO3/K3
3.4	Comparison test	R2	1.6	1.9	Black board	01		CO3/K3
3.5	DAlembert's ratio test	R2	1.11	1.14	Black board	01		CO3/K3
3.6	Raabe's test	R2	1.15	1.17	Black board	01		CO3/K3
3.7	Cauchy's Integral test	R2	1.9	1.10	Black board	01		CO3/K3
3.8	Cauchy's root test	R2	1.14	1.15	Black board	01		CO3/K3
3.9	logarithmic test	R2	1.17	1.18	Black board	01		CO3/K3
3.10	Leibnitz test by Alternating series	R2	1.19	1.22	Black board	01		CO3/K3
3.11	Absolute and Conditionally Convergence	R2	1.22	1.23	Black board	01		CO3/K2

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	UNIT-IV						
IV	**Calculus**					**15**	
4.1	Rolle's theorem	R3	330	331	Black board, PPT	01	CO4/K3
4.2	Lagrange's Mean value theorem	R3	339	340	Black board ,PPT	02	CO4/K3
4.3	Cauchy's Mean value Theorem	R3	353	354	Black board,PPT	01	CO4/K3
4.4	Taylor's Series	R3	358	359	Black board	01	CO4/K5
4.5	Revolution of curves to evaluate surface areas and volumes (only in Cartesian coordinates)	W11			Black board	02	CO5/K5
4.7	Forms of Beta functions	R3	462	465	Black board	02	CO5/K2
4.8	Problems on Beta functions	R3	465	472	Black board	02	CO5/K5
4.9	Relationship between Gamma and Beta functions	R3	474	475	Black board	01	CO5/K4
4.10	Problems on Gamma functions	R3	478	483	Black board	01	CO5/K5
4.11	Problems on Gamma and Beta functions	R3	496	514	Black board	02	CO5/K5
	UNIT-V						
V	**Multivariable calculus (Partial Differentiation and applications)**					**11**	
5.1	Definitions and problems of Limit and continuity	T2	365	368	Black board	01	CO6/K2
5.2	Problems on Partial Differentiation	R3	377	387	Black board	01	CO6/K5
5.3	Euler's Theorem	R3	388	390	Black board	01	CO6/K3
5.4	Total derivative	R3	398	394	Black board	01	CO6/K5
5.5	Jacobian functions	R3	395	403	Black board	01	CO6/K5
5.6	Functional dependence	R3	404	408	Black board	01	CO6/K3
5.7	Maxima and minima of functions of two variables	R3	416	417	Black board,PPT	02	CO6/K5
5.8	Maxima and minima of functions of three variables by using method of Lagrange multipliers.	R3	439	439	Black board	03	CO6/K5

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LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

T1. B.S.Grewal Higher Engineering Mathematics, Khanna Publishers,36th Edition,2010.
T2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & sons, 2006.
T3. G.B. and R.L.Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint 2002.

REFERENCE :

R1: N.P.Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
R2. Ramana B.V., Higher   Engineering Mathematics, Tata McGraw Hill, New Delhi, 11th Reprint, 2010.
R3. Engineering Mathematics by M.K.Jain, S.R.K.Iyenger, Narosa Publications.

Web links:

W-1. https://www.efunda.com/math/math_home/math.cfm
W-2. https://www.ocw.mit.edu/resources/#Mathematics
W-3. https://www.sosmath.com/
W-4. https://www.mathworld.wolfram.com/
W-5. https://www.e-booksdirectory.com/details.php?ebook=10166
W-6. https://www.e-booksdirectory.com/details.php?ebook=10166
W-7. https://swayam.gov.in/
W-8. **https://onlinecourses.nptel.ac.in/**
W9. **http://linear.ups.edu/html/section-PEE.html**
W10. **https://tutorial.math.lamar.edu/classes/de/ComplexEigenvalues.aspx**
w11. **https://tutorial.math.lamar.edu/classes/calcii/surfacearea.aspx**

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CONTENT BEYOND THE SYLLABUS

S.No	Topics	Proposed Actions	Date	Resource Person/Mode	POs	PSOs
1	Finding two non singular matrices using Normal form (PAQ form)	Black Board		K JYOTHI	1,2,4	2,3
2	Gauss Jacobian method	Black Board		S PRAVEEN	1,2,4	2,3
3	Finding the stationary point of a function of two variables using Lagrange's method of multiplier.	Black Board		M LEELA	1,2,12	2,3

ASSIGNMENT

S.No.	Assignment Questions	Course Outcome	Books To be Referred	Date Of Announcement	Date Of Submission
1.	Show that the only real number λ for which the system, $x+2y+3z =\lambda x$, $3x+y+2z= \lambda y$ and $2x+3y+z= \lambda z$ has non-zero solution is 6. And solve them when $\lambda=6$.	CO1	T1	4-1-2022	18-1-2022
2.	Solve the system of equations $20x+y-2z=17$, $3x+20y-z=-18$, $2x-3y+20z=25$ by Gauss Seidel iteration method	CO1	T1	4-1-2022	18-1-2022
3.	Verify Cayley-Hamilton theorem for A=$\begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ and hence find A^{-1} and find find B $=A^5 -4A^4-7A^3+11A^2-A-10\,I$.	CO2	R1	4-1-2022	18-1-2022

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4.	Develop the Quadratic form to canonical form $2x^2+2y^2+2z^2-2xy+2zx-2yz$ by orthogonal transformation.	CO2	R1	4-1-2022	18-1-2022
5.	Test the convergence of the series $\frac{3^2}{6^2}$ $+\frac{3^2 \cdot 5^2}{6^2 \cdot 8^2}+\frac{3^2 \cdot 5^2 \cdot 7^2}{6^2 \cdot 8^2 \cdot 10^2}+ - - - - - - -$	CO3	R2	4-1-2022	18-1-2022
6.	Examine the following series for absolute and conditional convergence. $\frac{1}{5\sqrt{2}} - \frac{1}{5\sqrt{3}} + \frac{1}{5\sqrt{4}} - - - - - - - - + (-1) \frac{1}{5\sqrt{n}}+$ $- - - - - - -$.	CO3	R2	4-1-2022	18-1-2022
7.	Verify Rolle's theorem for the function $f(x) = (x - a)(x - b)^n$ where m,n are positive integers in [a,b].	CO4	R2	4-1-2022	18-1-2022
8	State and Prove the relation between Beta and Gamma function.	CO5	R2	4-1-2022	18-1-2022
9	Show that the functions $u=xy+yz+zx$, $v=x^2+y^2+z^2$ and $w=x+y+z$ are functionally dependent. Find the relation between them .	CO6	R3	4-1-2022	18-1-2022
10.	Find the maximum value of $u= x^2y^3z^4$ if $2x+3y+4z=a$.	CO6	R3	4-1-2022	18-1-2022

SELF STUDY TOPICS			
S.No.	**Topics**	**Books & Journals**	**Course Outcomes**
1.	Basic Knowledge of Matrices	T1/ Linear Algebra and its Applications (ILAS)	CO1
2.	Progressions	NCERT Book	CO3
3.	Concept of Differentiation	R2 / Calculus by Michael Comenetz	CO4
4.	Definite and Indefinite Integrals	R2 / Calculus by Michael Comenetz	CO5
5.	Concept of Partial Differentiation	R3/ NPTEL	CO6

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)

(1. Remembering 2. Understanding 3. Applying 4. Analyzing 5. Evaluating 6. Creating)

UNIT-1 : MATRICES		
1 MARKS QUESTIONS	**BT Level**	**Course Outcome**
1. Define Hermitian matrix. **(Remembering)**	1	CO1
2. Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 7 \\ 2 & 5 & 5 \end{bmatrix}$	1	CO1
3. Find whether the matrix $[cos\theta \quad sin\theta - sin\theta \quad co]$ is orthogonal.	1	CO1
4.. Find '**k'** if the rank of matrix $\begin{bmatrix} k-1 & 0 \\ 0 & k-1 \\ -1 & 0 & k \end{bmatrix}$ is 2.	1	CO1
5. Find whether the matrix A= $\begin{bmatrix} 0 & i \\ -i & 0 \end{bmatrix}$ is unitary.	2	CO1
6. Find the value of '**k'** such that the rank of matrix A is 2 where A=$\begin{bmatrix} 1 & 1 & -1 \\ 2 & -3 & 4 \\ 3 & -2 & k \end{bmatrix}$.	1	CO1
7. Define orthogonal and unitary matrices	1	CO1
8 Write the condition for consistent and inconsistent of non-homogeneous system	5	CO1
9 Find A , if A=$\begin{bmatrix} 1+i & 3 \\ 2-i & 4+2i \end{bmatrix}$	2	CO1
10 Find rank of the matrix $\begin{bmatrix} 1 & -7 & 3 \\ 7 & 20 & -2 \\ 5 & -2 & 4 \end{bmatrix}$	1	
4 MARKS QUESTIONS		
1. If A = $\begin{bmatrix} & \\ -1 & 1 \end{bmatrix}$ then Find (A-2I)(A-3I).	1	CO1
2. Show that $\begin{bmatrix} 0 & 1 & -2 \\ -1 & 0 & 3 \\ 2 & -3 & 0 \end{bmatrix}$ is skew symmetric	2	CO1

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3.	Evaluate A^2-3A+9I where A=$\begin{bmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ -3 & 1 & 2 \end{bmatrix}$	5	CO1
4.	Find the rank of the matrix $\begin{bmatrix} 2 & 3 & 4 & 5 \\ 3 & 4 & 5 & 6 \\ 4 & 5 & 6 & 7 \\ 9 & 10 & 11 & 12 \end{bmatrix}$ **(JULY-201).**	1	CO1
5.	Find the rank of the matrix$\begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$	1	CO1
6.	For what value of k the matrix A=$\begin{bmatrix} 4 & 4 & -3 & 1 \\ 1 & 1 & 1 & -1 \\ 0 & k & 2 & 2 \\ 9 & 9 & k & 3 \end{bmatrix}$ has rank 3	4	CO1
7.	Show that A =$\frac{1}{2}$ $\begin{bmatrix} -1 & 1 & 1 & 1 \\ 1 & -1 & 1 & 1 \\ 1 & 1 & -1 & 1 \\ 1 & 1 & 1 & -1 \end{bmatrix}$ is orthogonal.	2	CO1
8	Find the inverse of the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 1 & -3 \\ -2 & -4 & -4 \end{bmatrix}$ by elementary row operations	1	CO1
9	Find the rank of the matrix A=$\begin{bmatrix} -1 & -3 & 3 & -1 \\ 1 & 1 & -1 & 0 \\ 2 & -5 & 2 & -3 \\ -1 & 1 & 0 & 1 \end{bmatrix}$ by reducing to echelon form	1	CO1
10	Solve the system of equations 3x+y-z = 3 , 2x-8y+z =-5 , x-2y+9z =8 using Gauss elimination method	3	CO1
11	Define Hermition , skew Hermition , orthogonal and Unitary matrices. **(DEC-2016/JAN-2017)**	1	CO1

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12	Test the consistency and hence solve the system the system x+y+z=6,x-y+2z=5, 3x+y+z=8, 2x-2y+3z=7 **(DEC -2018)**	1	
	10 MARKS QUESTIONS		
1	Find the non- singular matrices P and Q such that PAQ is of the *normal form* where $A=\begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \\ 3 & 0 & 5 & -10 \end{bmatrix}$ **JULY-2018).**	1	CO1
2	Show that the only real number λ for which the system, **x+2y+3z =λx ,** **3x+y+2z= λy** and **2x+3y+z= λz** has non-zero solution is 6. And solve them when **λ=6**.	2	CO1
3	Solve the system of equations 20x+y-2z=17, 3x+20y-z=-18, 2x-3y+20z=25 by Gauss Seidel iteration metho**d (JULY-2021).**	3	CO1
4	Find whether the following systems of equations are consistent, if so solve them x+2y+2z=2, 3x-2y-z=5, 2x-5y+3z= -4, x+4y+6z=**0**	1	CO1
5	Discuss for what value of λ , μ simultaneous equations x+y+ z=6**,** **x+2y+3z=10,x+y+ λz=μ** have i) no solution ii) a unique solution iii) an infinite number of solutions.	6	CO1
6	Discuss for what value of α, μ simultaneous equations 2**x+3y+ ₅z=9, 7x+3y-2z=8,** **2x+3y+ λz=μ have** i) no solution ii) a unique solution iii) an infinite number of solutions. **(DEC-2018)**	6	CO1
7	Show that every square matrix is uniquely expressible as the sum of Hermitian and Skew-hermitian matrix.	2	CO1
8	By reducing the matrix A =$\begin{bmatrix} 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$ into normal form , find its rank	2	CO1
9	Prove that the following set of equations is consistent and solve them. 3x+3y+2z=1 , x+2y =4 ,10y + 3z =-2,2x-3y-z=5.	2	CO1
10	If A =$\begin{bmatrix} 3 & 7-4i & -2+5i \\ 7+4i & -2 & 3+i \\ -2-5i & 3-i & 4 \end{bmatrix}$ then show that A is Hermitian and iA is skew –hermitian.	2	CO1

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11	Apply Gauss – Seidal iteration method to solve the system of equations $83x +11y - 4z = 95;\quad 7x + 52y +13z = 104;\ 3x + 8y + 29z = 71$. **(DEC-2018)**	3	CO1
12	For what values of k the equations x + y+z = 1; 2x + y+4z =k ;4x +y +10z =k^2 have a solution and solve them completely in each case	3	CO1
Unit -II :			
1 MARKS QUESTIONS			
1.	Find the Eigen values for A = $\begin{bmatrix} & \\ 1 + 3i & 7 \end{bmatrix}$	1	CO2
2.	State Cayley –Hamilton theorem	1	CO2
3.	Find the matrix related to the Quadratic form $ax^2+2hxy+by^2$	1	CO2
4.			
5.	Find the quadratic form corresponding to the matrix A= $\begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix}$	6 1	CO2 CO2
6.	Find the Rank of Quadratic form $2x_1x_2 + 6x_1x_3 - 4x_2x_3$.	1	CO2
7. 8	Identify the nature of quadratic form $x^2 + y^2 + z^2$ - 2xy. Find the Eigen values for the matrix A=$\begin{bmatrix} 1 & 0 & 3 \\ 2 & -1 & -1 \\ 1 & -1 & 1 \end{bmatrix}$	3 1	CO2 CO2
9. 10	Define index and signature of the quadratic form. Find the Eigen values of $\begin{bmatrix} i & 0 & 0 \\ 0 & 0 & \\ 0 & i & 0 \end{bmatrix}$	1 1	CO2 CO2
4 MARKS QUESTIONS			
1	Find the Eigen values and the corresponding Eigen vectors of $\begin{bmatrix} 2 & 1 \\ 4 & 5 \end{bmatrix}$.	1	CO2
2.	Find the Eigen values and the corresponding Eigen vectors of the Hermitian matrix $\begin{bmatrix} 2 & 3 + 4i \\ 3 - 4i & 2 \end{bmatrix}$.	1	CO2
3.	Find the sum and product of Eigen values of the matrix A =$\begin{bmatrix} 2 & 5 & 7 \\ 1 & 4 & 6 \\ 2 & -2 & 3 \end{bmatrix}$	1	CO2
4.	Prove that zero is Eigen value of a matrix if and only if it is singular.	2	CO2
5.	Prove that the Eigen values of a Hermitian matrix are all real.	2	CO2

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6.	Find the Eigen values of the Hermitian matrix $\begin{bmatrix} a & b+ic \\ b-ic & k \end{bmatrix}$.	1	CO2
7.	If $A = \begin{bmatrix} 2 & 5 & 7 \\ 1 & 4 & 6 \\ 2 & -2 & 3 \end{bmatrix}$ then find eigen valuesof A^{-1}	1	CO2
8	Using Cayley-Hamilton theorem find A^8 , if A= $\begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$.	3	CO2
9	Verify Cayley-Hamilton theorem for A=$\begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ and hence find A^{-1} and find find B =A^5 - $4A^4$-$7A^3$+$11A^2$-A-10 I .	3	CO2
12	If λ is an Eigen value of an orthogonal matrix, then 1/ λ is also its Eigen value. **(DEC-2018)**	2	CO2
13	Show that A= $\begin{bmatrix} a+ic & b+id \\ b+id & a-ic \end{bmatrix}$ is unitary if a^2+b^2+c^2+d^2=1 (DEC-2016/JAN-2017)	2	CO2
14	Determine eigen values and corresponding Eigen vectors of the matrix$\begin{bmatrix} 2 & 1 & -1 \\ 1 & 1 & -2 \\ -1 & -2 & 1 \end{bmatrix}$ (JULY-2021).	1	CO2
15	Prove that $(AB)^* = B^* A^*$ (DEC-17/JAN- 18)	5	CO2
16	Find the Eigen values of A^{-1} , when A =$\begin{bmatrix} 1 & 2 & 3 \\ 0 & 2 & 5 \\ 0 & 0 & 3 \end{bmatrix}$ (JUNE-2019)		
	10 MARKS QUESTIONS		
1	Find the Eigen values and the corresponding Eigen vectors of the matrix $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$	1	CO2
2	Develop the Quadratic form to Canonical form $2x^2$+$5y^2$+$3z^2$+4xy	6	CO2
3	Develop the Quadratic form to canonical form $2x^2$+$2y^2$+$2z^2$-2xy+2zx-2yz by orthogonal transformation.	6	CO2
4	Find the nature of Quadratic form, index, and signature of $10 x^2$+ $2y^2$ + $5z^2$-4xy – 10 xz +6 yz. **(Remembering)**	1	CO2
5	Find a matrix P which transform the matrix A=$\begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$ to diagonal form. Hence find A^4.	1	CO2

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6	If A=$\begin{bmatrix} 1 & 2 & -1 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$ using cayley-Hamilton theorem find A^4	1	CO2
7	Find the Diagonalization of the matrix A = $\begin{bmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$	1	CO2
8	If A=$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$ using cayley-Hamilton theorem find A^{-1}	3	CO2
9	The sum of the Eigen values of a square matrix is equal to its trace and product of the Eigen values is equal to its determinant.		CO2
10	Develop the quadratic form $3x^2+2y^2+3z^2-2xy-2yz$ to the normal form by orthogonal transformation. (DEC-2018)	6	CO2
11	Find the Eigen values and corresponding Eigen vectors of the matrix $=\begin{vmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{vmatrix}$ (DEC-2016/JAN-2017)	2	CO2
12	Diagonalizable the matrix A=$\begin{vmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{vmatrix}$ (DEC-2016/JAN-2017)	2	CO2
13	Reduce the Quadratic form 2xy+2xz+2yz to the canonical form by orthogonal transformation . (DEC-2016/JAN-2017)	5	CO2
14	Verify Cayley Hamilton theorem and hence find A^{-1} , if A= $\begin{vmatrix} 3 & 1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 5 \end{vmatrix}$ (DEC-2018)	3	CO2

Sub. Code & Title	(R20MTH1101) :MATHEMATICS-I(Linear Algebra & Calculus)		
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15	Verify Cayley Hamilton theorem and hence find A^{-1}, if A=$\begin{bmatrix} 7 & 2 & -2 \\ -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}$ **(JULY-2021) (JUNE-2019)**	3	
16	Reduce the quadratic form $x_1^2+5x_2^2+x_3^2+2x_2x_3+x_3x_1+2x_1x_2$ into canonical form by using orthogonal reduction and find rank , index ,signature .Also state nature of the quadratic form and write the transformation that transform to the canonical form. **(JULY-2021).**		
	Unit – III : SEQUENCES AND SERIES		
	1MARK QUESTIONS		
1.	Test for convergence of $\sum \frac{1}{n^3}$	4	CO3
2.	Define Comparison Test	1	CO3
3	Define D Alembert's ratio test	1	CO3
4.	Define Raabe's test	1	CO3
5	Test for convergence$\sum_{n=0}^{\infty} \frac{1}{\sqrt{n+1}}$.	4	CO3
6.	Define alternating series& give an example	1	CO3
7	Define absolute convergence.	1	CO3
8.	Test the series $\sum u_n$ whose nth term is $\frac{1}{4n^2-1}$	4	CO3
9.	Test for convergence$\sum_{n=0}^{\infty} \frac{(-1)^n}{!}$	4	CO3
10.	Define Cauchy's nth root test. .	1	CO3
	4 MARKS QUESTIONS		
1.	Examine the convergence of $\frac{1}{ } - \frac{1}{ } + \frac{1}{ } - - - - - - - -$	4	CO3
2	Examine the convergence of $\frac{ }{3} + \frac{ }{ } - \frac{ }{ } - \frac{ }{ } + - - - - -$	4	CO3
3.	Test for convergence of the series $\sum_{ }^{\infty} \frac{1.3.5........(2n+1)}{2.5.8......(3n+2)}$	4	CO3
4	Test for convergence of $\sum_{n=1}^{\infty} \frac{1}{2n+3n}$	4	CO3
5.	Show that $\frac{1}{1^p} + \frac{2}{2^p} + \frac{3}{3^p} + \frac{4}{ } + $ ------------s convergent for p>2 and divergent for p≤2.	2	CO3
6	Test for convergence of the series $\sum_{n=1}^{\infty} \frac{1}{(loglogn)}$	4	CO3
7.	Test the convergence of the series $\sum_{n=1}^{\infty} \frac{(2n)!}{n!}$	4	CO3
8.	Test the convergence of the series $\sum \frac{x^n}{n^{n-1}}$, (x>0).	4	CO3

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Faculty Name & Designation	**U ANURADHA** Assistant Professor	

9	Test for convergence of the series if $u_n = \sum \dfrac{\surd}{n^2+1}$ **(DEC-2018)**	4	CO3
10	Test for the convergence of the series $\sum(\sqrt{n^2+1}-\sqrt{n^2-1})$ (DEC-2016/JAN-2017)	4	CO3
11	Test the convergence of the series $1+\dfrac{1}{2^2}+\dfrac{2^2}{3^3}+\dfrac{3^3}{4^4}+\text{-----------}$ (JULY-2021)		
	10 MARKS QUESTIONS		CO3
1	Test for convergence of $\sum \sqrt{n^3+1}-\sqrt{n^3}$.	4	CO3
2	Examine the convergence of $\sum [[\overline{}]]$ $3.6.9\text{------}n$	4	CO3
3	Test for the convergence of the series whose n the term is $\dfrac{x^{2n-2}}{\sqrt{(n+1)}}$	4	CO3
4	Discuss the convergence of $\sum n(n+1)x^{n+1}$,(x>0)	6	CO3
5	Test the convergence of the series $\sum\dfrac{(n!)^2}{(2n)!}x^{2n}$	4	CO3
6	Test for absolute convergence of the series $\sum\dfrac{x^{(-1)}}{n+1}$ (DEC-2018)	4	CO3
7	Test the convergence of the series $\dfrac{3^2}{6^2}+\dfrac{3.5^2}{6^2.8^2}+\dfrac{3.5^2.7^2}{6^2.8^2.10^2}+\text{- - - - - - -}$	4	CO3
8	Examine the convergence of the series $\dfrac{x}{1+x}+\dfrac{x^2}{1+x}+\dfrac{x^3}{1+x^3}+\text{........}\infty$ (DEC-2018)	4	CO3
9	Examine the following series for absolute and conditional convergence. $\dfrac{1}{5\sqrt{2}}-\dfrac{1}{5\sqrt{3}}+\dfrac{1}{5\sqrt{4}}\text{- - - - - - - -}+(-1)\dfrac{1}{5\sqrt{n}}+\text{- - - - - -}$	4	CO3
10	Test the convergence of the series whose nth term is $\sum\dfrac{}{n^3+1}x^n$,x>0 (DEC-2016/JAN-2017)	4	CO3
11	Examine the convergence of the series $x+\dfrac{1}{2}.\dfrac{x^3}{3}+1.3.\dfrac{x^5}{2.4}.\dfrac{x^5}{5}+1.3.5.\dfrac{x^7}{2.4.6}.\dfrac{x^7}{7}+\text{………}$ (JULY -2021)	4	CO3
12	Discuss the series $\dfrac{x}{\sqrt{3}}-\dfrac{x^2}{\sqrt{5}}+\dfrac{x^3}{\sqrt{7}}\text{..................}$ for absolute and conditional convergence (JULY -2021)	6	CO3
13	Examine the convergence of the series $\sum\dfrac{(n+1)^n x^n}{x^{n+1}}$ (JUNE-2019)	4	C03

	SRI INDU COLLEGE OF ENGG & TECH		
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	Faculty Name & Designation	**U ANURADHA** Assistant Professor	

14	Test for absolute convergence of the series $x - \frac{x}{4} + \frac{x}{9} - \frac{x}{16} + \ldots\ldots\ldots\ldots$(JUNE-2019)	4	CO3

Unit-IV :			
1 MARK QUESTIONS			
1.	Define Rolle's theorem	1	CO4
2.	Develop Maclaurin's series expansion of *sin x*	6	CO4
3.	Define Beta function	1	CO5
4.	What is the relation between Beta and Gamma function	1	CO5
5.	Find the value of (i) $\Gamma(\frac{11}{2})$ (ii) $\Gamma(\frac{-1}{2})$	1	CO5
6.	Define Lagrange's Mean Value theorem	1	CO4
7.	Define Gamma function	1	CO5
8	Define Cauchy's Mean Value theorem	1	CO4
9	Find the volume of the solid that result when the region enclosed by the curve $y = x^3$, x =0, y =1 is revolved about the Y-axis.	1	CO4
4 MARKS QUESTIONS			
1.	Verify Lagrange's mean value theorem for f(x)=*log x* in [1,e]	3	CO4
2.	Find the value of 'c' by Cauchy mean value theorem for f(x) = x^2 & g(x) = x^3 in [1,2]	1	CO4
3.	Find the region in which f(x) =1-4x-x^2 is increasing and the region in which it is decreasing Using mean value theorem.	1	CO4
4.	Verify Rolle's theorem for f(x)=$|x|$ in [-1,1]	3	CO4
5.	The arc of the curve x=y^3 between y=0 and y=2 is revolved about y-axis. Find the area of Surface so generated.	1	CO4
6.	Verify Rolle's theorem for $f(x) = (sinx - cosx)$ in [$\frac{\pi}{4}, \frac{5\pi}{4}$].	3	CO4
7.	Show that $\Gamma(\frac{1}{2}) = \sqrt{\pi}$	2	CO5
8	Show that $\int_0^{} e^{} dx = \frac{}{2}$	2	CO5
9	Show that $\Gamma(n) = \int_0^{} \left(log\frac{}{x}\right)^{n-1} dx$ n>0.	2	CO5
10	Find the volume of the solid formed by the revolution, about the x-axis of the curve $2ay^2 = x(x-a)^2$. **(DEC-2018)**	1	C04

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11	State Lagrange's mean value theorem and verify for f(x) = sinx in [0,π] (JULY -2021).		
	10 marks questions		
1	Verify Rolle's theorem for the function $f(x) = (x − a)^m(x − b)^n$ where m,n are positive integers in [a,b].	3	CO4
2	Verify whether Rolle's theorem can be applied to the following functions in the intervals cited: i) $f(x) = tan\,x$ in [0,π] ii) $f(x) = \frac{1}{x^2}$ in [-1,1] iii) $f(x)= x^3$ in [1,3]	3	CO4
3	Using Lagrange's mean value theorem for 0<a< b prove that $1-\frac{a}{b} < log\,\frac{b}{a} < \frac{b}{a}-1$ and Hence Show that $\frac{1}{6} < log\frac{6}{5} < \frac{1}{5}$	2	CO4
4	1. Show that $\frac{x}{\sqrt{1-x^2}} = x + 4\frac{x^3}{3!}+ ......$	2	CO4
5	Write Taylor's series expansion for the function f(x) = log(cosx) about the point $\frac{\pi}{3}$	3	CO4
6	Find the volume of solid obtained by revolving one arc of the cycloid $x=a(\theta+sin\theta),y=a(1+cos\theta)$	1	CO4
7	Prove that the curved surface area of a sphere of radius r intercept between two parallel planes at a distance a and b from the centre of the sphere is 2πr (b-a) when b>a and hence deduce the surface area of the sphere.	5	CO4
8	Show that $\int_a (x − a)^m(b − x)^n\,dx = (b − a)^{m+n+1}\,B(m + 1, n + 1)$.	2	CO5
9	State and Prove the relation between Beta and Gamma function (DEC-2018).(JULY-2021) , (JUNE -2019).	5	CO5
10	Show that $\int_0^\infty x^4 e^{-x^2}\,dx = \frac{3\sqrt{\pi}}{8}$	2	CO5
11	Prove that $\frac{\pi}{3} − \frac{1}{5\sqrt3} > COS^{-1}\frac{3}{5} > \frac{\pi}{3} − \frac{1}{8}$ using lagrange's mean value theorem. (DEC-2016/JAN-2017)	2	CO4
12	Verify Lagrange's mean value theorem for f(x)=(x-1)(x-2)(x-3) in [0,4] (DEC-2018)	3	CO4

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Faculty Name & Designation	**U ANURADHA**	Assistant Professor

13	Using mean value theorem when 0<a<<b, prove that $1-\frac{a}{b} < \log\left(\frac{b}{a}\right) < \frac{b}{a}-1$ and Hence Show that $\frac{1}{6} < \log\frac{6}{5} < \frac{1}{5}$	3	CO4

Unit-V:			
1 MARK QUESTIONS			
1.	*Evaluate* $\left(\dfrac{}{x^2+y^2+1}\right)$	5	CO6
2.	State Euler's theorem.	1	CO6
3.	Write the Lagrange's function for xy subject to $3x^2+y^2 =6$.	6	CO6
4.	Find $\dfrac{\partial u}{\partial x \partial y}$ when u = $x^3+y^3 +2xy$.	1	CO6
5.	Write the formula for the Jacobian of u, v,w with respect to x,y,z.	6	CO6
6.	Find the stationary points of $f(x,y) = x^3+3xy^2-3x^2-3y^2+4$.	1	CO6
7.	If u $=3x^2yz+5x^2y^2+4z^4$ then find the value of $x\frac{\partial u}{\partial x} +y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}$	1	CO6
8	Find $\frac{\partial u}{\partial x} +\frac{\partial u}{\partial y}$ when u = $\log(x^2+y^2)$	1	CO6
9	If $\frac{\partial(u,v,w)}{\partial(x,y,z)} = 4$ then find the value of $\frac{\partial(x,y,z)}{\partial(u,v,w)}$	1	CO6
			CO6
4 MARK QUESTIONS			
1.	Find the first and second order partial derivatives of x^3+y^3-3axy and verify $\dfrac{\partial^2 f}{\partial x\partial y}= \dfrac{\partial^2 f}{\partial y\partial x}$	1	CO6
2.	If x=u(1+v), y=v(1+u) then prove *that* $\dfrac{\partial(x,y)}{\partial(u,v)} = 1 + u + v$	5	CO6
3.	If u=x^2-2y, v=x+y+z, w=x-2y+3z find $\dfrac{\partial(u,v,w)}{\partial(x,y,z)}$	1	CO6
4	If $u =\dfrac{x+y}{1-xy}$, v=$Tan^{-1}x+Tan^{-1}y$ find $\dfrac{\partial(u,)}{\partial(x,y)}$. Hence prove that u and v are functionally dependent and find the relation between them	5	CO6
5.	Find the maximum value of f(x, y)= $x^3+3xy^2-3x^2-3y^2+4$	1	CO6
6.	Find the minimum value of the function f(x) = x^5-3x^4+5	1	CO6
7.	Find the minimum value of $x^2+y^2+z^2$ *given* x+y+z =3a	1	CO6
8	Write about maxima and minima of the function two variables f(x,y). (DEC-2016/JAN-2017)	6	CO6

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Faculty Name & Designation	**U ANURADHA**	Assistant Professor

9	If u = x(logxy) where $x^3+y^3+3xy =1$, find $\frac{\_\_}{dx}$ (DEC-2018)	1	C06
	10 marks questions		
1	If $u = \frac{1}{\sqrt{x^2+y^2+z^2}}$, x^2+y^2+z^2≠0 *then prove that* $\frac{\partial^a}{\partial x^2}+\frac{\partial^a}{\partial y^2}+\frac{\partial^a}{\partial z^2} = 0$	5	CO6
2	If x=r cosθ, y=r sinθ show that $\frac{\partial r}{\partial x} = \frac{\partial x}{\partial r}$ and $\frac{1}{r}\frac{\partial x}{\partial \theta} = r\frac{\partial \theta}{\partial x}$	2	CO6
3	If u=x+y+z, y+z=uv ,z=uvw then show that $\frac{\partial}{\partial(x,y,z)} = u_2 v$	2	CO6
4	If x= e^r secθ, y= e^r tanθ *prove that* $\frac{\partial(x,y)}{\partial(r,\theta)} \times \frac{\partial(r,\theta)}{\partial(x,y)} = 1$	5	CO6
5	Show that the functions **u=xy+yz+zx , v=x^2+y^2+z^2 and w=x+y+z** are functionally dependent. Find the relation between them	2	CO6
6	Show that the function **u= $sin^{-1}x+sin^{-1}y$, $v = x\sqrt{1-y^2}+ y\sqrt{1-x^2}$** are functionally related. Find the relation between them	2	CO6
7	Find three positive numbers whose sum is **100** and whose product is maximum	1	CO6
8	Find the stationary points of u(x ,y)=sinx siny sin(x+y) where 0<x<π, 0<y<π and find the maximum and minimum values of u. (DEC-2018) , (DEC-2016/JAN-2017)	1	CO6
9	Find the maximum and minimum values of f(x, y) = 2(x^2-y^2)-x^4+y^4	1	CO6
10	Find the maximum value **of u= x^{2}y^{3}z^4** if **2x+3y+4z=a**		
11	Prove that the functions **u = x + y + z, v = xy + yz + zx , w=$x^2 + y^2 + z^2$** are dependent and find the relation between them. **(DEC-2018)**	1	CO6
12	Determine maxima and minima of f(x,y) = $x^3y^2(1 - x - y)$. (JULY-2021)	2	CO6
13	If $x_x y_y z_z$ = e then show that $\frac{\partial^2 z}{\partial x \partial y}$ = - $(xlogex)^{-1}$ at x =y = z. (JULY-2021).	5 / 2	CO6 / CO6
14	A rectangular box open at the top is to have volume of 32 cubic feet . Find the dimensions of the box requiring least material for its construction. (JUNE -2019)	3	CO6
15	Prove that u $=\frac{x+y}{1-xy}$ and v = $\tan^{-1} x + \tan^{-1} y$ are functionally related .Also find the relationship (JUNE -2019)	5	CO6

Sri Indu College of Engineering & Technology

(an Autonomous Institution under JNTUH)

I B.Tech I Semester End Examinations

Model Question Paper

MATHEMATICS-I

(R20MTH1101)

(LINEAR ALGEBRA & CALCULAS)

(Common to All branches)

Time: 3 hours   Max. Marks: 70

PART-A

Answer the following questions: **5 X 4 = 20**

1. Prove that $\frac{1}{2}\begin{bmatrix} i & \sqrt{3} \\ \sqrt{3} & i \end{bmatrix}$ is a unitary matrix

2. Find the Eigen values of the matrix $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$

3. If $u_n = \sqrt{n^4 + 1} - \sqrt{n^4 - 1}$ then show that $\sum u_n$ is convergent
4. Verify Rolle's theorem for $f(x) = (x - a)^m(x - b)^n$ in [a,b]

5. If **u = x+y, v = xy** then find $\dfrac{\partial(u,v)}{\partial(x,y)}$

PART-B

Answer any *five* questions of the following: **5 X 10 = 50**

UNIT-I

6. Discuss for what values of λ, μ the simultaneous equation's
   x+y+z=6; x+2y+3z=10; x+2y+λz= μ have (i) No solution (ii) unique solution
   (iii) an infinite number of solutions

(or)

7. Find the Rank of the matrix by reducing it into the Normal form

$$\begin{bmatrix} 1 & 2 & -1 & 3 \\ 4 & 1 & 2 & 1 \\ 3 & -1 & 1 & 2 \\ 1 & 2 & 0 & 1 \end{bmatrix}$$

UNIT-II

8. Reduce the quadratic form $3x^2+2y^2+3z^2-2xy-2yz$ to the normal form by orthogonal transformation.

(or)

9. If $A=\begin{bmatrix} 1 & 2 & -1 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$ using Cayley-Hamilton theorem find A^4

UNIT-III

10. Examine the convergence of $\sum \left[\dfrac{1.4.7.\ldots\ldots(3n-2)}{3.6.9\ldots\ldots}\right]^2$

(or)

11. Test for absolute convergence of the series whose n th term is $\sum \dfrac{(x+2)(-1)^n}{2^y+5}$

UNIT-IV

12. Using Lagrange's mean value theorem for $0<a<b$ Prove that $1-\dfrac{a}{b} \le \log\dfrac{b}{a} \le \dfrac{b}{a}-1$ and hence Show that $\dfrac{1}{6} < \log\dfrac{6}{5} < \dfrac{1}{5}$

(or)

13. Prove that $\int_0^1 (logx)^n \, dx = (-1)^{n!} \dfrac{}{(m+1)^{+1}}$

where n is a positive integer and $m > -1$

UNIT-V

14. Prove that the functions $u = x + y + z, \ v = xy + yz + zx, \ w = x^2 + y^2 + z^2$ are dependent and find the relation between them.

(or)

15. Find the maximum and minimum values of $f(x,y) = xy + \dfrac{a^3}{x} + \dfrac{a^3}{y}$

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| **B.Tech** | **Semester**   (REGULAR)   **End Examinations July - 2 21**

MATHEMATICS-I

07/07/2021   (Common to ALL Branches)   Day- 1 (FN)

Duration: 3 Hrs   **Maximum Marks: 70**

Answer all the following questions. **SECTION-A**   (5Qx **4M** = 20M)

1. Find rank of the matrix. $\begin{bmatrix} 1 & 1 & & \\ & & & \end{bmatrix}$

2. Determine Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 1 & 1 & -1 \\ 1 & 1 & -2 \\ -1 & -2 & 1 \end{bmatrix}$

3. Test the convergence of the series $1 + \frac{1}{2^2} + \frac{2^2}{3^3} + \frac{3^3}{4^4} + \cdots$

4. State Lagrange's mean value theorem and verify the theorem for $f(x) = sinx$ in $[0, \pi]$.

5. If $u = x^2 + y^2 + z^2, v = xy + yz + zx, w = x + y + z$ find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$

SECTION – B

Answer FIVE questions choosing a : : from each unit   (5Qx10M =SOM)

UNIT

6. Find non singular matrices P   t.PAQ is in normal form where,

$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \\ 3 & 0 & 5 & -10 \end{bmatrix}$. Al fi

(OR)

7. Apply Gauss-Sei e method to solve the system of equations.

$20x + y$ $3x + 20y - z = -18$, $2x - 3y + 20z = 25$.

UNIT-II

8. Verify Cayley-Hamilton theorem for the matrix A and hence find A^{-1} where

$A = \begin{bmatrix} 1.6 & 1 & -2 \\ 6 & 2 & -1 \end{bmatrix}$. $A^{-1} = \frac{1}{3}$

(OR)

9. Reduce the quadratic form $x_1^2 + 5x_2^2 + x_3^2 + 2x_2x_3 + 6x_3x_1 + 2x_1x_2$ into canonical form by using orthogonal reduction and find rank, index, signature. Also state nature of the quadratic form and write the transformation that transform to the canonical form.

P.T.O.

lo
. Examine the convergence of the series $X + \dfrac{x^3}{2 \cdot 3} + \dfrac{1.3 \cdot x^5}{2.4 \cdot 5} + \dfrac{1.3.5 \cdot x^7}{2.4.6 \cdot 7} + \cdots$ _....., , Cj)-

(OR)

1.1 Discuss the series $\dfrac{x}{3} - \sqrt{S} + \sqrt{?} - \cdots$ for absolute convergence and conditional convergence.

fl.4n <-91,- /J'

12. Establish a relation between $f3$ and Γ.

(OR)

13. Write Taylor's series expansion for the function $f(x) = logcosx$ about the point rr./3.
.- ||> v   ,_./?J.

14. Determine maxima and minima of $f(x, y) = x^3 y^2 (1 - x - y)$.

(OR)

15
. If $xx\,yy\,zz = c$ then show that $\dfrac{\partial^2 z}{\partial x\,\partial y} = -(x log ex)-$ at $x = z$)(, ?.,)'

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| **B.Tech** | **Semester**   (SUPPL.)   **End Examinations July - 2021**

MATHEMATICS-I

07/07/2021   (Common to ALL Branches)   Day- 1 (FN)

Duration: 3 Hrs   **Maximum Marks:** 70

SECTION-A

Answer all the following questions.   (5Qx 4M = 20M)

1. Find inverse of the matrix A= $\begin{bmatrix} 3 & 2 \\ t & 1 \end{bmatrix}$ by applying Cayley-Hamilton theorem.

2. Show that the matrix $A = \begin{bmatrix} 2 & 2-i & 7+i \\ 5 & ? & ? \\ 5+3i & -5i & 2 \end{bmatrix}$ is Hermitian matrix. If as skew-Hermitian matrix.

3. Test conditional convergence of the series $-\frac{}{2} + \frac{2}{5} - \frac{}{10} + \frac{}{17} + \cdots$

4. Test the functions u and v for functional dependence where
   $u = \frac{x+y}{1-xy}$, $v = tan^{-1}x + tan^{-1}y$

5. Find unit normal vector to the surface $x^2 y + 2x z^2 = 8$ at the point $(1, 0, 2)$.

SECTION – B

Answer FIVE questions choosing at lea   ach unit   (5Qx10M =50M)

6.
   a) Find rank of the matrix A by   it mto Nonnal fonn where A= $\begin{bmatrix} 1 & 2 & -2 \\ 0 & 2 & 6 \\ 1 & 3 & 1 \end{bmatrix}$

   b) Test for consistency and s   e pe system of equations
   $x + 2y + z = 2, 2x ;-   - = 2, 4x - 7y - 5z = 2.$

   (OR)

7.
   a) Find Eigen values an Eigen vectors of the matrix $\begin{bmatrix} 7 & 5 \\ 1 & 2 & 2 \end{bmatrix}$

   b) Show that   ly real number A for which the system and solve the system of equations
   $x + 2y + 3z = AX, 3x + y + 2z = AY, 2x + 3y + z = AZ$ has non-zeros olution is 6
   and solve them when $A = 6$.

   UNIT-II

8. Express the quadratic form $3x^2 + 5y^2 + 3z^2 - 2xy - 2yz + 2zx$ into canonical form using orthogonal transformation and find rank, index, signature. Also state nature of the quadratic form.

   (OR)

9. a) Prove that any square matrix can be expressed as sum of Hermitian and skew-Hermitian matrices.
   b) Prove that product of two orthogonal matrices is an orthogonal matrix.

P.T.O.

UNIT-ill

10.
a) Test the convergence of the series $1 + \frac{1}{2}x + \frac{2!}{3^2}x^2 + \frac{3!}{4^3}x^3 + \frac{4!}{5^4}x^4 + \cdots$

b) Test the convergence of the series $L = \sum_2 (-1)^{n-1} \frac{t^n}{n^{n-1}}$ $0 < x < 1$.

(OR)

11.
a) Test the convergence of the series $L = \sum_2 \frac{1}{n \, (\log n)^p}$, $p > 0$.

b) Verify Lagrange's mean value theorem for $f(x) = (x - 1)(x - 2)(x - 3)$ in $[0,4]$.

UNIT-IV

12.
a) Trace the curve $y^2(2a - x) = x^3$.

b) Expand $f(x, y) = \sin(xy)$ about $(1,)$ in Taylor series.

(OR)

13.
Find the maximum and minimum values of the function $u = xy^2z^3$ subject $u($

$\phi(x,y,z) = x+y+z- 6 = 0$ using Lagrange's method of multipliers.

UNIT-V

14.
a) Find the work done in moving a particle in the force field $F = 3x^2\bar{\imath} + (2xz - y)\bar{\jmath} + z\bar{k}$ along the straight line from $(0,0,0)$ to $(2,1,3)$.

b) Evaluate $\int_0^a \int_{x^2/a}^{2a-x} x y^2 \, dy dx$ by changing the order of integration.

(OR)

15.
Verify the Greens theorem in plane for c $[(y - \ln x)dx + \cos x \, dy]$, where C is the plane triangle formed by the lines $y = 0, x = \frac{2}{\pi} y$

* * *

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)(Recognized under 2(t) and I2(B) ofUGC Act 1956)

I B.Tech - I Semester -End Examinations (Suppl.) October-2020
R18MTH1101-MATHEMATICS-I(LINEAR ALGEBRA AND CALCULUS)
(Common to All Branches)

<u>Duration:2 Hrs</u>   13.10.2020 (FN)   <u>Max Marks:70M</u>

Section -A

Answer Any <u>Three</u> of the following questions.   **Marks: 3Qx6M =18M**

I. Using Gauss-Jordan Method find the inverse of the matrix $[\begin{smallmatrix} 1 & 3 \\ -2 & -4 \end{smallmatrix}]$

2. Find the eigenvalues of the matrix $[\begin{smallmatrix} i & = \\ -1 & -2 & 1 \end{smallmatrix}]$ and also find s n values.

3. Examine the convergence of the sequence $lln =$

4. Find the value of 'c' of Cauchy's Mean value theorem fo f (3 and $g(x)=$ in (1, e].

5. *If* $u = x \log xy$ *where* $x^3 + y^3 + 3xy = 1$ *find*

Section - B

Answer <u>*FOUR*</u> questions from the folio wing

Marks: 4Qx13M = 52M

UNIT – I

6. (a) Reduce the matrix into eche on fo   and find its rank
$$\begin{vmatrix} 0 & 1 & -3 & -I \\ 0 & 1 & I \\ 3 & I & 0 & 2 \\ 1 & I & -2 & 0 \end{vmatrix}$$

(b). Solve the system of equ   om pletely
$3x + 4y-\ z - 6w = 0, 2x + 3y + 2z - 3w = 0, 2x + y-14z - 9w = 0,$
$x + 3y + 13\_ 3w = 0$.

(OR)

7. (a) Test   ency and solve.
$x - 2y + t\ 2, 2x + y + z + t = -4, 4x - 3y + z + 7t = 8.$
(b) Solve the system of equations by Gauss elimination method.
$x + 2y + z = 3, 2x + 3y + 2z = 5, 3x - Sy + Sz = 2, 3x + 9y - z = 4.$

UNIT-II

8. Verify Cayley-Hamilton theorem for the matrix A and find its inverse
$$A = \begin{bmatrix} - & -: & - \\ 1 & -1 & 2 \end{bmatrix}$$

(OR)

9. Reduce the quadratic form to a canonical form by an orthogonal reduction and discuss its nature $x^2 + Sy^2 + z^2 + 2xy + 2yz + 6zx.$

UNIT-ill

10. (a). Test for convergence of the series

$$1 + \frac{1}{2^2} + \frac{2}{3^3} + \frac{3}{4^4} + \ldots\ldots\ldots\ldots\ldots\ldots\ldots$$

(b) Test for convergence of the series $I \div 1$

(OR)

11. (a). Discuss the nature of the series $\frac{1}{2} + 1x + \underline{C_1} \, x^2 + \underline{G_2} \, x^3 + \ldots \ldots \ldots \ldots \quad (x > 0)$.

(d) Test whether the following series is absolutely convergent or not

$$\sum_{n=2}^{\infty} \frac{(-1)n}{n(\log n)2}.$$

12. (a) Ex and log x in powers of (x-1).   **UNIT IV**

(b) Using Lagrange's Mean value theorem fi2d the value of 'c'

$$f(x) = x(x - 1)(x - 2) \quad on \quad [0 \quad 2 \;] \; .$$

(OR)

13. (a) Express the following integral interms of gam aa function $\iint \underline{\cot 0} \; d0$.

(b) Find the area lying between the paprabola $X = 4x - x^2$ and the line $y = x$.

14. (a) If $\log u = \frac{x^3 + y^3}{3x + 4y}$ using Euler's find **UNIT-V**

(b) If $u = 3x + 2y - z,\ v = x \,-i-r\quad$ w $= x(x + 2y - z)$ Show that u, v and w are functionally related and find the relation hip.

OR)

15. (a) Find the dimensions ofth rectan   Jar box open at the top of max imum capacity whosesurfaceis432 Sr r ..... ,

(d) Discuss the Maxima and "nimum values of $x^3 + y^3 - 3axy$

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SRINDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)(Recognized under 2(t) and 12(8) ofUGC Act 1956)

I B.Tech - I Semester-End Examinations (Regular/Suppl.) Dec/Jan-2019-20
R18MTH1101- MATHEMATICS -I (LINEAR ALGEBRA AND CALCULUS)
(Common to all the branches)

Duration: 3 Hrs   23.12.2019   **Max Marks: 70M**

Section -A

Answer _All_ the following questions   **Marks: 5Qx4M = 20M**

1. Show that $A = \begin{pmatrix} co;e & si;O) \\ -sin0 & 0 & cos0 \end{pmatrix}$ is orthogonal.

2. Find the eigenvalues of the matrix $\begin{bmatrix} !6 & & !4 \\ 2 & -4 & 3 \end{bmatrix}^{6}$ and also **fin3di** ersie eigen values.

3. Examine the following sequence for convergence $Cln = 1 + \frac{(-1)n}{}$

4. Find the value of 'c' of Rolle 's Theorem for $f(x) = (x + 2)^3 (n - 3)$ ·n [-2,3] .

5. If $u = x^2 + y^2 + z^2$ _and_ $x = e2t$ $,y = e2t \cos 3t , z = e2t s1$: as a total Derivative.

Section -

Answer any _FIVE_ questions bychoosing at lea   -rom each Unit
          Marks: SQxlOM = SOM

UNIT – I

6. (a) Reduce the matrix in to no f form and find its rank $\begin{vmatrix} 2 & 3 & 4 & 5 \\ 3 & 4 & 5 & 6 \\ 4 & 5 & 6 & 7 \\ 9 & 10 & 11 & 12 \end{vmatrix}$

   (b). Find the value of k for   he system of equations has a non-trivial solution.
   $(3k - 8)x + 3y + 3z =$ $3x + (3k - B)y + 3z = 0,\ 3x + 3y + (3k - B)z = 0$

(OR)

7.   f a and sothat the equations.
   $2x + 3y$ $z -$, $+ 3y - 2z = 8, 2x + 3y + az = f3$ have (i) no solution
   (ii) a unique   lut on and (iii) an infinite number of solutions

UNIT-II

8. (a) Using Cayle y-Hamilton theorem find its inverse of

   $\begin{bmatrix} 21 & 01 & -] \\ 1 & -1 & 1 \end{bmatrix}$

   (b). Reduce the matrix $A = \begin{pmatrix} 1 & 2 \\ -;\_ & -;\_ \\ -1 & -1 & 0 \end{pmatrix}$ to the diagonal form.

(OR)

9. Reduce the quadratic form to a canonical form by an orthogonal reduction and discuss its nature $3x^2 + 3y^2 + 3z^2 + 2xy + 2xz - 2yz.$

P.T.O

UNIT- III

I0. (a). Test for convergence the series $\underset{n=1}{\overset{\text{CXI}}{\text{L.t}}} \frac{1}{\lfloor n+n+1}$.

(b) Test for convergence the series $\text{L.t } \sin \frac{1}{n} \frac{1}{n}$

(OR)

11. (a) Discuss the nature of the series $\sum (\log n)^{-\frac{2}{n}}$.

(b) Test whether the following series is convergent or not $\underset{n=1}{\overset{\text{CXI}}{\text{L.t}}} \frac{(-1)^{r-1}n}{zn-1}$.

UNIT-IV

12. (a) Prove that $\log(1+x) = \frac{1}{1+0x}$ $where\ 0 < 0 < 1$ and hence deduce that
$\frac{1+x}{1+x} < \log(1+x) < x ,x > 0$.

(b) Verify Cauchy's-Me an value theorem for the functions $ex\ and\ ex$ tire r terval (a, b).

(OR)

13. (a) Express the following integral in terms of gamma function $\int_0^{00} ex\ a$.

(b) Show that the area between the paprabolas $y^2 = 4ax\ an\ x - 4$ $is\ \frac{16}{3}a^2$.

UNIT-V

14. (a) Find the maximum and minimum distances of the point (3,4,12) from the sphere $x^2 + y^2 + z^2 = 4$.

(b) If $u = x./1 - y^2 + ,v = \sin^{-1}x + \sin^{-1}y$ Show that u and v are function ally related and find the rel ·

15. (a) If $u = \sin^{-1}\left(\frac{x+ 2y+3z}{x^8+y^8+z^8}\right)$ fi d t $y\frac{au}{ay} + z\frac{au}{az}$.

(b) In a plane triangle, fmd the ma e of $\cos A \cos B \cos C$.

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Subject Code: R14MTH1101

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

Recognized under 2(f) and 12(B) of UGC Act 1956

I B.Tech-1 Semester-End Examinations (Suppl.)- June 2019
MATHEMATICS-I
(Common to All Branches)

Duration: 3 Hrs   03.06.2019   Max Marks: 70M

Section-A

Answer _All_ the following questions   **Marks: 5Qx4M = 20M**

1. Find the Rank of the matrix[

2. Show that $A = \begin{bmatrix} a+id & -b+ic \\ b+id & a-ic \end{bmatrix}$ 'ts unitary 'f $a^2 + b^2 + c^2 + d^2 = 1$.

3. Verify Rolles theorem for the function $log\left[\frac{a}{a+b}\right]$ in [a b], $a > 0, b > 0$.

4. Discuss the maximum and minimum of $x^2 + y2 + 6x + 12$.

5. Evaluate $\int_0^{a \sin l} \int_0^{\frac{a}{a-2r}} r \, dr \, d\theta$.

Section – B

Answer any _FIVE_ questions choo   ne from each Unit

Marks: 5Qx10M = SOM

UNIT -I

6. Show that the only real number λ fo   hich the system x+2y+3z=Ax;3x + y + 2z= Ay;2x + 3 y+z= 'A,z has non-zero solution is 6 and solve the m,when A. = 6.

(OR)

Verify Cayley-Hamilton theorem for the matrix A- [}   !H   1   Hence find A^{-1}.

UNIT-II

8. Reduce the quadratic form $10x^2 + 2y2 + 5z^2 - 4xy-10xz+6yz$ to canonical form by diagonolization reduction and find its rank and signature.

(OR)

9. By Lagrange 's reduction transform the quadratic form X^1AX to sum of squares form for

A=[!   2],   4   -2   18.

UNIT-III

10. Discuss the convergence of $\frac{x}{1.3} + \frac{x^2}{3.5} + \frac{x^3}{7.9} + ...$ (x > 0)

(OR)

11. Prove that $^{7r:}$ + ₁ . -1 3 7r: 1

    $$6 \; \underline{\text{s v'J≤s m}} \qquad 6 + 8.$$

UNIT-IV

12. Find the co-ordinates of the centre of curvature at any point of the parabola y2=4ax.He nce show that its evolute is $27ay2=4(x-2a)^3$

    (OR)

13. If x+y+z=u,y+z=uv,z=uvw then evalute. $\frac{\partial(x,y,z)}{\partial(u,v,w)}$.

UNIT-V

14. Verify Green's theorem for $\int (3x^2 - 8y^2) \, dx + (4y - 6xy) \, dy$ whe re C is the region bounded by x=O, y=O and x+y=1.

    (OR)

15. Verify Stokes theorem for $F = (2x - y) \, f - yz2J - y2z \, k$ over the upper half surface of the sphere

    $x^2+y2+z2=1$ bounded by the projection of the xy-plane.

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Subject Code: Rl8MTH1101

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

Recognized under 2(f) and 12(B) of UGC Act 1956

l B.Tech- l Semester-End Examinations (Regular) December - 2018

MATHEMATICS - I   (Linear Algebra and Calculus)

(Common to All Branches)

<u>**Duration: 3 Hrs**</u>   **19.12.2018**   <u>**Max Marks: 70M**</u>

Section-A

Answer <u>***All***</u> the following questions   Marks: 5Qx4M $=$ 20M

1. Define Hennition , skew Hennition , orthogonal and Unitary matrices.

2. If A. is an eigen value of an orthogonal matrix, then 1/ A. is also its eigen value.

3. Test for convergence of the series if $Un = \dfrac{L\ f}{n+1}$

4. Find the volume of the solid fonned by the revolution, about the x-axis of the curve
   $2ay2 = x(x-a)2$

5. If $u = xlogxy$ where $x^3 + y3 + 3.xy = 1$, find $\dfrac{du}{dx}$

Section- B

Answer any <u>***FIVE***</u> questions choosing at least one from each Unit

Marks: 5Qx10M $=$ SOM

UNIT - I

6. Discuss for what values of A, μ the simultaneous equation's
   $2x+3y+5z=9; 7x+3y-2z=8; 2x+$ $z=$ ave
   (i) No solution   (ii) U 1 e so tion   (iii) An infinite number of solutions.

(OR)

7. Apply Gauss - Seidal iteration method to solve the system of equations
   $83x + I Iy - 4z = 95;$ $7x + 52y+13z = 10 4; 3x+8y + 29z = 7 1.$

UNIT-II

8. Verify   ii on theorem and hence find A-^{1}, if

   A $\begin{bmatrix} 3 & 1 \\ & \end{bmatrix}$

(OR)

9. Reduce the quadratic fonn $3x^2 + 2y2 + 3z2 - 2xy - 2yz$ to the nonnal fonn by orthogonal transfonnation.

UNIT-ID

10. Examine the convergence of the senes $- \dfrac{x}{1+x} - + \dfrac{x^2}{1+x} - + \dfrac{x^3}{1+x^3} + ...^{00}$

(OR)

11. Test for absolute convergence of the series $\sum \dfrac{x^n (-1)^n}{n+1}$

UNIT - IV

12. Verify Lagrange's mean value theorem for $f(x) = (x-1)(x-2)(x-3)$ in $[0,4]$

(OR)

13. Derive the relation between Beta and Gamma functions.

UNIT-V

14. Prove that the functions $u = x + y + z$, $v = xy + yz + zx$, $w = x^2 + y^2 + z^2$ are dependent and find the relation between them.

(OR)

15. Find the maximum and minimum values of $sinx.siny.sin(x+y)$

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l B.Tech - l Semester - l Mid Term Examinations, October -2019

(R18MTH1101) MATHEMATICS- I

(Linear Algebra and Calculus)

(Common to All Branches)

Duration: 90Mins   Day-I FN   Max Marks: 25M

Section -A

Answer *All* the questions   **Marks: 5Qx1M = SM**

1. Define Hermitian matrix.

2. Find fue ,   of the matrCT $A-U$ $\begin{bmatrix} i & -\} & :: \end{bmatrix}$

3. Find fue quadratic fomt corresponding to fue matrix -A [   ]

4. Identify the nature of quadratic form $JC+ y2 + i1- 2xy$.

5. Test for convergence of $I \, n^{\frac{1}{}}$

Section -B

Answer any *FOUR* questions   **Marks: 4Qx5M = 20M**

6. Find the rank of the matrix A= $\begin{bmatrix} -1 & -3 & -13 & -0 \\ 2 & & 2 & 3 \\ -1 & 1 & 0 & 1 \end{bmatrix}$ by reducing echelon from

7. Show that the only real number).. for which the system, $x+2y+3z =.a, 3x+y+2z= .ly \text{ and } 2x+3y+z= .lz$ has non-zero solution is 6. And solve them when **l=6.**

8. Solve the system of equations $3x+y-z=3, 2x-8y+z=-5, x-2y+9z=8$ using Gauss-Elimination method.

9. If A=$\begin{bmatrix} ! \\ \cdot \\ 3 & 5 & 6 \end{bmatrix}$ using cayley-Hamilton theorem find A"^{1}

10. Develop the quadratic fonn $3JC+2y2+3/-2xy-2yz$ to the normal form by orthogonal transformation.

11. Test for convergence of $L \ n^3 + 1- \ n^3.$

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BR-18   SRI INDU **COLLEGE OF ENGINEERING & TECHNOLOGY**   **D4**

(An Autonomous Lnstitution Under 2(f) and I2(B) of UGC Act I956, New Delhi)

I **B.Tech** - I **Semester** - II **Mid Term Examinations,** December - 2019

(R18MTH1101) MATHEMATICS - I

(Linear Algebra and Calculus)

(Common to All Branches)

Duration: 90Mins   Date: 12.12.2019 (FN)   Max Marks: 25M

Section - A

Answer *All* the questions   Marks: SQxl M = SM

1. Define alternating series& give an example.

.2 Find the value of 'c' by Cauchy mean value theorem for $f(x) = x^2$ & $g(x) = x^3$ in [1,2].

3. Find the value of (i) $\Gamma\left(\dfrac{}{2}\right)$ (ii) $\underline{\Gamma\left(\dfrac{1}{2}\right)}$.

4. If $x=u(J+v)$, $y=v(l+u)$ then prove *that* $\dfrac{\partial(x,y)}{\partial(u,v)} = 1 + u + v$

5. If $u=x^2-2y$, $v=x+y+z$, $w=x-2y+3z$ find $\dfrac{\partial(u,v,w)}{\partial(x,y,z)}$.

Section - B

Answer any *FOUR* questions   Marks: 4Qx5M = 20M

6. Test the convergence of the series $\dfrac{(n!)'}{(2n)!} \times n^2$.

7. Examine the convergence of $\dfrac{3}{4} - \dfrac{5}{7} + \dfrac{7}{10} - \dfrac{9}{13} - + - - - - - - -$.

8. Verify Rolle's theorem for the *function $f(x) = (x - a)m(x - bn)$* where m,n are positive integers in [a,b].

9. State and Prove the relation between Beta and Gamma function.

10. Show what the functions $u=xy+yz+zx$, $v=x^2+y2+z2$ *and* $w=x+y+z$ are functionally dependent. Find the relation between them.

11. Find the maximum value of $u = x^2 / z4$ if $2x+3y+4z=a$.

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I B.Tech - I Semester - I Mid Term Examinations, September -2018

(R18MTH1101) MATHEMATICS- I
(Linear Algebra and Calculus)
(Common to All Branches)

Duration: 90Mins I Day-FN Max Marks: 25M

Section -A

Answer **All** the questions Marks: 5Qx1M = SM

1. Is the matrix $\begin{bmatrix} cos0 & sin0 \\ -sin0 & cos0 \end{bmatrix}$ is orthogonal

2. Find the rank of the matrix A= $\begin{bmatrix} 1 & -7 & 3 & -3 \\ 7 & 20 & -2 & 25 \\ 5 & -2 & 4 & 7 \end{bmatrix}$

3. Identify the nature of quadratic form $x^2 + ..; + z^2 - 2xy$.

4. Find **the eigen values for the matrix A-** $\begin{bmatrix} 0 & 3 \\ & \end{bmatrix}$

S. Test for convergence of $I \;,$

Section -B

Answer any **FOUR** questions Marks: 4Qx5M = 20M

6. Find the rank of the matrix A= $\begin{bmatrix} -1 & -3 & & -11 \\ 1 & & -13 & \\ 2 & & 2 & 3 \\ -1 & 1 & 0 & 1 \end{bmatrix}$ by reducing echelon from.

7. Solve the system of equations $3x+y-z =3$, $2x-8y=z=-5$, $x-2y+9z=8$ using gauss elimination method.

8. If $A=\begin{bmatrix} ! & i & =! \\ 2 & -2 & 1 \end{bmatrix}$ using cayley-Hamilton theorem find A^4

9. **Diagonalise the matrix A -** $\begin{bmatrix} -8 & -21 \\ -3 & -2 \\ -4 & 1 \end{bmatrix}$

10. Reduce the quadratic form $3x^2+2y +3z^2-2xy-2yz$ to the normal form by orthogonal transformatio.n

11. Discuss the convergence of $\}: n(n+1)xn+1$,(x>0)

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(An Autonomous Institution Under 2(£) and 12(B) of UGC Act 1956, New Delhi)

I **B.Tech** - I **Semester** - II **Mid Term Examinations, Nov/Dec** - **2018**

(R18MTH1101) MATHEMATICS- I
(Linear Algebra and Calculus)
(Common to All Branches)

Duration: 90Mins   **Date: 29.11.2018 FN**   **Max Marks: 25M**

Section-A

Answer _All_ the questions   **Marks: SQxlM = SM**

1. State Leibnitz test.

2. Find the value of 'c' by Cauchy mean value theorem for $f(x) = x^2$ & $g(x) = x^3$ in [1,2]

3. Define Beta function

4. If $x=u(1+v)$, $y=v(1+u)$ then prove that $\dfrac{\partial(x, y)}{\partial(u, v)} = 1 + u + v$

5. Eva luate $\lim_{\substack{x \to 1 \\ y \to 2}} \left(\dfrac{x^2 \, y}{x^2+y^2+1} \right)$

Section - B

Answer any _FOUR_ questions   **Marks: 4Qx5M = 20M**

6. Test the convergence of the series $\sum \dfrac{(n \, !)^2}{2n \, !} x^n$ •

7. Examine the following series for absolut e and conditional convergence.
$$\frac{1}{n} - \frac{1}{3} + \frac{1}{4} - \cdots + (-1)^{n-1}\frac{1}{n} + \cdots$$

8. Us ing Lagrange's mean value theorem for $0 < a < b$ prove that $1- \; < \log \; < \; -1$ and hence show that $-\dfrac{1}{6} < \log\dfrac{6}{5} < \dfrac{1}{5}$

9. Show that $\int_0^\infty x^4 e^{-x^2} \, dx = 3../iil8$

10. Show that the functions $u=xy+yz+zx$, $v=x^2+y2+z2$ and $w=x+y+z$ are functionally dependent. Find the relation between them.

11. Find the maximum value of $u= x^2 y3 z^4$ if $2x+3y+4z=a$

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I B.Tech - I Semester - I Mid Term Examinations

(R16MTH1101) MATHEMATICS- I

(Common to All Branches)

<u>Duration: 90Mins</u>   <u>Date: 05.10.2017 FN</u>   <u>Max Marks: 25M</u>

Section-A

Answer <u>All</u> the questions   **Marks: Sxl = SM**

I.   Find the rank of the matrix $A \sim \begin{bmatrix} & 3 & -31 \\ -2 & & 2 \\ 4 & & 7 \end{bmatrix}$

2.   Find **K** if the **rank** of matrix $\begin{bmatrix} j & -i & -1 \end{bmatrix}$ is 2

3.   Find the Eigen values of $\begin{bmatrix} i & 0 & 0 & d \\ 0 & i & 0 \end{bmatrix}$

4.   Identify the nature of quadratic form $x^2 + y2 + z2 - 2xy$.

5.   Prove that the sequence $\{n; +1\}$ is convergent.

Section -B

Answer any <u>FOUR</u> questions   **Marks: 4x5 = 20M**

6.   Discuss for what values of $Ji., \mu$ the simultaneous equation's x+y+z=6; x+2y+3z=10; x+2y+Ji.z= μ have
     (i) No solution
     (ii) A unique solution
     (iii) An infinite number of solutions.

7.   Diagonalise the matrix $A = \begin{bmatrix} : & = & ; J \\ 3 & -4 & 1 \end{bmatrix}$

8.   Reduce the quadratic form $3x^2 + 2y2 + 3z^2 - 2xy - 2yz$ to the normal form by orthogonal transformation.

9.   If $A = \begin{bmatrix} -i & 3+2i & -2 \\ -3+2i & 0 & \frac{2}{3} - 4i \\ 2-i & -3-4i & -2i \end{bmatrix}$ then prove that A is a skew Hermitian matrix.

10. Find the Eigen values and Eigen vectors of the Hermitian matrix $\begin{bmatrix} 2 & 3+24i \\ 3-4i & \end{bmatrix}$

11. If $Un = n^4 + 1 - n^4 - 1$ then show that $\}: Un$ is convergent.

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BR-16　　　**SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY**　　　**D4**

(An Autonomous Institution Under 2(t) and I2(B) ofUGC Act 1956, New Delhi)

I B.Tech - I Semester - II Mid Term Examinations
(R16MTH1101) MATHEMATICS-I　　(Common to All Branches)

Duration: 90Mins　　　　　**Date: 04.12.2017 FN**　　　　　**Max Marks: 25M**

Section -A

Answer _All_ the questions　　　　　　　　　　　　　　　**Marks: 5xl = 5M**

1.　Find the value of 'c' by Rolle's theorem for f(x)= sinx in [0,n]

2.　If u = x+y, v = xy then find $\frac{o(u,v)}{o(x,y)}$.

3.　Write the necessary conditions for f(x,y) to have maximum or minimum at (a,b)

4.　IfF = x^2yz find gradf at the point (1,-2,1)

5.　State Green's theorem in a plane.

Section - B

Answer any _FOUR_ questions　　　　　　　　　　　　**Marks: 4x5 = 20M**

6.　Verify Rolle's theorem for f(x)=lxl in [-1,1]

7.　Find the point on the plane x+2y+3z=4 that is closest to the origin.

8.　Find the radius of curvature at any point of the cycloid x = a(8+sin0) , y = a(1-cos0) at $e = \frac{-}{2}$

9.　Find the constants a,b,c so that the vector A= (x+ 2y+ az)i + (b x-3y-z)j + (4x+cy+2z)k is irrotational. Also find 0 such that $A = 'v(/)$

10.　Verify Green's theorem for $I(3x^2 - 8y^2)dx + (4y - 6xy)dy$ where C is the region bounded by x=0,y=0,and x+y=1.

11.　Evaluate $III\ xyz\ dxdyd\ z$ over the positive octant of the sphere x²+y2+z2= $a2$

***

APPLIED PHYSICS

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)

B.Tech. - I Year – I Semester

L	T	P	C
3	1	0	4

(R20EAP1101) APPLIED PHYSICS

Course Objectives:
- Students will demonstrate skills in scientific inquiry, problem solving and laboratory techniques.
- Students will be able to demonstrate competency and understanding of the concepts found in Quantum Mechanics, Fiber optics and lasers, Semiconductor physics and Electromagnetic theory and a broad base of knowledge in physics.
- The graduates will be able to solve non-traditional problems that potentially draw on knowledge in multiple areas of physics.
- To study applications in engineering like memory devices, transformer core and electromagnetic machinery.

Course Outcomes: Upon graduation:
a. The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.
b. The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
c. Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
d. The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.

UNIT-I: Quantum Mechanics

Introduction to quantum physics, Black body radiation, Planck's law, Photoelectric effect, Compton effect, de-Broglie's hypothesis, Wave-particle duality, Davisson and Germer experiment, Heisenberg's Uncertainty principle, Born's interpretation of the wave function, Schrodinger's time independent wave equation, Particle in one dimensional box.

UNIT-II: Semiconductor Physics

Intrinsic and Extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature, Carrier generation and recombination, Carrier transport: diffusion and drift, Hall effect, p-n junction diode, Zener diode and their V-I Characteristics, Bipolar Junction Transistor (BJT): Construction, Principle of operation.

UNIT-III: Optoelectronics

Radiative and non-radiative recombination mechanisms in semiconductors, LED and semiconductor lasers: Device structure, Materials, Characteristics and figures of merit, Semiconductor photodetectors: Solar cell, PIN and Avalanche and their structure, Materials, working principle and Characteristics.

UNIT-IV: Lasers and Fibre Optics

Lasers: Introduction to interaction of radiation with matter, Coherence, Principle and working of Laser, Population inversion, Pumping, Types of Lasers: Ruby laser, Carbon dioxide (CO_2) laser, He-Ne laser, Applications of laser. Fibre Optics: Introduction, Optical fibre as a dielectric wave guide, Total internal reflection, Acceptance angle, Acceptance cone and Numerical aperture, Step and Graded index fibres, Losses associated with optical fibres, Applications of optical fibres.

UNIT-V: Electromagnetism and Magnetic Properties of Materials

Laws of electrostatics, Electric current and the continuity equation, Ampere's and Faraday's laws, Maxwell's equations, Polarisation, Permittivity and Dielectric constant, Internal fields in a solid, Clausius-Mossotti equation, Ferroelectrics and Piezoelectrics. Magnetisation, permeability and susceptibility, Classification of magnetic materials, Ferromagnetism and ferromagnetic domains, Hysteresis, Applications of magnetic materials.

TEXT BOOKS:
i. Engineering Physics, B.K. Pandey, S. Chaturvedi - Cengage Learing.
ii. Halliday and Resnick, Physics - Wiley.
iii. A textbook of Engineering Physics, Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - S. Chand

REFERENCES:
a) Richard Robinett, Quantum Mechanics
b) J. Singh, Semiconductor Optoelectronics: Physics and Technology, Mc Graw-Hill inc. (1995).
c) Online Course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak Guptha on NPTEL

SRI INDU COLLEGE OF ENGG & TECH

LESSON PLAN

(Regulation :R20)

Department of Electronics Communication & Engineering

Prepared on

Rev1:

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Academic Year: 2021-22	Year/Sem./Section	I/I - ECE-A,B,C & D
Faculty Name & Designation	N Shailaja/ Dr. P Balasubramanyam/E Bala Raju/Ashok Kumar CH	

Unit No.	Topic (s)	Book Reference	Page(s) From	Page(s) To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			UNIT – I					
	QUANTUM MECHANICS					**12**		
1.1	**Quantum Mechanics:** Introduction to quantum physics, Black body radiation	T- 1,T-2	1.1	1.2	Black Board	1		CO1,L2
1.2	Planck's radiation law	T – 2	1.4	1.6	Black Board	2		CO1,L2
1.3	Photoelectric effect and Einstein photo electric equation	T – 2,T-3	1.7	1.13	Black Board	2		CO1,L2
1.4	Compton effect and expression for Compton shift	T – 2,T-3	1.14	1.18	Black Board	2		CO1,L2
1.5	de-Broglie's hypothesis, Wave-particle duality, Davisson and Germer experiment,	T – 2	1.19	1.25	Black Board	2		CO1,L2
1.6	Heisenberg's Uncertainty principle, Born's interpretation of the wave function	T – 2	1.26	1.26	Black Board	1		CO1,L2
1.7	Schrodinger's time independent wave equation	T – 2,T-3	1.27	1.28	Black Board	1		CO1,L2
1.8	Particle in one dimensional box.	T – 2,T-3	1.31	1.32	Black Board	1		CO1,L2
	Review	**Signature of the HOD/Coordinator :**						
			UNIT - II					
	SEMICONDUCTOR PHYSICS					**15**		
2.1	**Semiconductor Physics:** Intrinsic semiconductors	T – 1, T-3	2.46	2.46	Black board	1		CO2,L2
2.2	Density of electrons in Intrinsic semiconductor	T – 1,T-3	2.49	2.50	Black board	1		CO2,L2
2.3	Density of holes in Intrinsic semiconductor	T – 1,T-3	2.50	2.51	Black board	1		CO2,L2
2.4	Dependence of Fermi level on carrier-concentration and temperature	T – 1,T-3	2.50	2.53	Black board	1		CO2,L2
2.5	Intrinsic carrier concentration	T – 1,T-3	2.53	2.56	Black board	1		CO2,L2
2.6	Extrinsic semiconductors: N-type Semiconductor	T – 1,T-3	2.58	2.61	Black board	2		CO2,L2
2.7	P-type semiconductor	T – 1,T-3	2.62	2.63	Black board	2		CO2,L2
2.8	Fermi level variation with temperature in extrinsic semiconductor, Carrier generation and recombination	T – 1,T-3	2.69	2.71	Black board	1		CO2,L2

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Unit No.	Topic (s)	Book Reference	Page(s) From	To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
2.9	Carrier transport: diffusion and drift	T – 1,T3	2.71	2.71	Black board	1		CO2,L2
2.10	Hall Effect	T – 1,T-3	2.72	2.77	Black board	1		CO2,L2
2.11	p-n junction diode, Zener diode and their V-I Characteristics	T – 1,T-3	2.78	2.86	Black board	2		CO2,L2
2.12	Bipolar Junction Transistor (BJT): Construction, Principle of operation	T-1,T-3	2.87	2.91	Black board	1		CO2,L2
Review		**Signature of the HOD/Coordinator :**						
UNIT – III								
OPTOELECTRONICS						**7**		
3.1	**Optoelectronics:** Radiative and non-radiative recombination mechanisms in semiconductors	T-3	3.98	3.98	Black board	1		CO3,L3
3.2	LED: Device structure, Materials, Characteristics and figures of merit	T-3	3.99	3.101	Black board	1		CO3,L3
3.3	Semiconductor lasers: Device structure, Materials, Characteristics and figures of merit	T-3	3.102	3.108	Black board	1		CO3,L3
3.4	Semiconductor photo detectors	T-3	3.108	3.110	Black board	1		CO3,L3
3.5	Solar cell: structure, Materials, working principle and characteristics.	T-3	3.111	3.113	Black board	1		CO3,L3
3.6	PIN Diode: structure, Materials, working principle and characteristics.	T-3	3.114	3.115	Black board	1		CO3,L3
3.7	Avalanche Photodiode: structure, Materials, working principle and characteristics.	T-3	3.116	3.117	Black board	1		CO3,L3
Review		**Signature of the HOD/Coordinator :**						
UNIT - IV								
LASERS & FIBER OPTICS						**10**		
4.1	**Lasers:** Lasers: Introduction to interaction of radiation with matter	T – 1	4.113	4.114	Black board	1		CO4,L6
4.2	Coherence, Principle and working of Laser, Population inversion, Pumping	T – 1	4.118	4.122	Black board	1		CO4,L6
4.3	Types of Lasers: Ruby laser	T – 1	4.123	4.124	Black board	1		CO4,L6

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Unit No.	Topic (s)	Book Reference	Page(s) From	To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
4.4	Carbon dioxide (CO2) laser	T – 1	4.127	4.129	Black board	1		CO4,L6
4.5	He-Ne laser, Applications of lasers in various fields	T – 1	4.125	4.139	Black board	1		CO4,L6
4.7	**Fiber Optics:** Acceptance angle, Acceptance cone and Numerical aperture	T – 1	4.141	4.145	Black board	2		C CO4,L6
4.8	Types of optical fibers	T – 1	4.147	4.152	Black board	1		CO4,L6
4.9	Losses associated with optical fibers, Applications of optical fibers.	T – 1	4.152	4.155	Black board	2		CO4,L6
Review		**Signature of the HOD/Coordinator :**						
UNIT – V								
ELECTROMAGNETISM & MAGNETIC PROPERTIES OF MATERIALS						**12**		
5.1	**Electromagnetism and Magnetic Properties of Materials:** Laws of electrostatics, Ampere's and Faraday's laws / Fundamental laws of electromagnetism	T – 1,T-2	5.177	5.179	Black board	1		CO5,CO6,L4,L6
5.2	Electric current and the continuity equation	T – 1,T-2	5.178	5.178	Black board	1		CO5,CO6,L4,L6
5.3	Maxwell's equations	T – 1	5.180	5.182	Black board	2		CO5,CO6,L4,L6
5.4	Polarization, Permittivity and Dielectric constant	T-1	5.186	5.187	Black board	1		CO5,CO6,L4,L6
5.3	Types of Polarizations	T-1	5.194	5.200	Black board	1		CO5,CO6,L4,L6
5.5	Internal fields in a solid	T-1	5.189	5.193	Black board	1		CO5,CO6,L4,L6
5.6	Clausius-Mossotti equation, Ferroelectrics and Piezoelectrics	T-1	5.201	5.209	Black board	1		CO5,CO6,L4,L6
5.7	Magnetization, permeability and susceptibility	T-1	5.210	5.213	Black board	1		CO5,CO6,L4,L6
5.8	Classification of magnetic materials, Ferromagnetism	T-1,T-2	5.214	5.218	Black board	1		CO5,CO6,L4,L6
5.9	Domain theory of Ferromagnetism & Hysteresis curve	T-1	5.219	5.221	Black board	1		CO5,CO6,L4,L6
5.10	Soft and Hard magnetic materials and applications of magnetic materials	T-1	5.222	5.223	Black board	1		CO5,CO6,L4,L6
Review		**Signature of the HOD/Coordinator :**						

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LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

1. Engineering Physics, B.K. Pandey, S. Chaturvedi - Cengage Learing.
2. Halliday and Resnick, Physics - Wiley.
3. A textbook of Engineering Physics, Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - S. Chand

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Weblinks

1. http://www.people.fas.harvard.edu/~djmorin/waves/quantum.pdf
2. https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/Map%3A_Physical_Chemistry_(McQuarrie_and_Simon)/01%3A_The_Dawn_of_the_Quantum_Theory/1.3%3A_Photoelectric_Effect_Explained_with_Quantum_Hypothesis
3. https://phys.libretexts.org/Bookshelves/University_Physics/Book%3A_University_Physics_(OpenStax)/Map%3A_University_Physics_III_-_Optics_and_Modern_Physics_(OpenStax)/6%3A_Photons_and_Matter_Waves/6.3%3A_The_Compton_Effect
4. https://nptel.ac.in/courses/122101002/downloads/lec-25.pdf
5. http://www3.imperial.ac.uk/pls/portallive/docs/1/2475915.PDF
6. http://www.optique-ingenieur.org/en/courses/OPI_ang_M05_C02/co/Contenu_04.html
7. https://www2.mvcc.edu/users/faculty/jfiore/Linear/SemiconductorDevices.pdf
8. https://www.allaboutcircuits.com/technical-articles/an-introduction-to-optoelectronics/
9. file:///C:/Users/sri%20indu/Downloads/190_Sample-Chapter.pdf
10. http://gn.dronacharya.info/ECE2Dept/Downloads/question_papers/ISem/Engg-Physics/UNIT-II/Dielectric-Magnetic-Properties.pdf
11. https://allbtechblog.files.wordpress.com/2016/08/dielectrics-lecture-notes.pdf
12. https://www.toppr.com/guides/physics/semiconductor-electronics-materials-device-and-simple-circuits/special-purpose-p-n-junction-diode/

SRI INDU COLLEGE OF ENGG & TECH

LESSON PLAN

(Regulation :R20)

Department of Electronics Communication & Engineering

Sub. Code & Title	R20EAP1101 & APPLIED PHYSICS		
Academic Year: 2021-22	Year/Sem./Section		I/I – ECE-A,B,C & D
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Content beyond the Syllabus

S.No	Topics	Proposed Actions	Date	Resource Person/Mode	POs	PSOs
1	GP Thomson Experiment	Seminar		N Shailaja	PO1	PSO1
2	Electron microscope Method	PPT		N Shailaja	PO1	PSO1
3	Applications of Heisenberg's uncertainty principle	Seminar		Dr. P Balasubramanyam	PO2	PSO1
4	Full wave & Half wave Rectifiers	PPT		E BalaRaju	PO2,PO5	PSO2,PSO3
5	Superconductivity	Seminar		Ashok Kumar CH	PO2	PSO2,PSO3

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Self Study Topics

S.No	Topics	Books/journals	Course Outcomes
1	De-Broglie concept of matter waves	T1	CO1
2	Black body radiation	T1	CO1
3	Formation of P-N junction diode and its V-I characteristics	T1	CO2
4	Bipolar Junction Transistor	T1	CO2
5	Characteristics of Laser	T1	CO4
6	Construction and principle of an optical fiber	T1	CO4
7	Classification of magnetic materials	T1	CO5
8	Laws of electromagnetism	T1	CO6

Sub. Code & Title	R20EAP1101 & APPLIED PHYSICS		
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ASSIGNMENT

S.No.	Assignment Questions	Course Outcome	Books To be Referred	Date Of Announcement	Date Of Submission
1	Explain de-Broglie concept of matter waves & Explain how Davisson-Germer experiment verifies dual nature of matter	CO1	T1	4-1-2022	18-1-2022
2	Define Photo electric effect. Explain Einsteins Photoelectric equation.	CO1	T1	4-1-2022	18-1-2022
3	Define Wave function. Obtain Schrodinger time independent wave equation	CO1	T1	4-1-2022	18-1-2022
4	Obtain Eigen values & Eigen function for a free particle in one dimensional potential box/infinite square well potential	CO1	T1	4-1-2022	18-1-2022
5	Distinguish between intrinsic and extrinsic semiconductors	CO2	T1	4-1-2022	18-1-2022
6	State and explain Hall effect. Derive Hall coefficient	CO2	T1	4-1-2022	18-1-2022
7	Explain V-I Characteristics of P-N junction diode & Zener diode	CO2	T1	4-1-2022	18-1-2022
8	Explain the principle & working of BJT	CO2	T1	4-1-2022	18-1-2022
9	State the principle and working of LED	CO3	T1	4-1-2022	18-1-2022
10	Distingush radiative & non-radiative recombination of charge carriers	CO3	T1	4-1-2022	18-1-2022
11	State & explain Hall effect	CO3	T1	4-1-2022	18-1-2022

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QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)

(1. Remembering 2. Understanding 3. Applying 4. Analyzing 5. Evaluating 6. Creating)

S.No.	UNIT-1 QUANTUM MECHANICS	BT Level	Course Outcome
	4 MARKS QUESTIONS		
1.	State & Explain Photo electric effect **(Dec-2018)**	2	CO1
2.	What are de-Broglie waves. Derive debrogile wavelength for an electron **(July-2021)**	2	CO1
3.	State and explain Heisenberg's uncertainty principle (July-2021, Sep-2020)	1	CO1
4.	What is Compton shift? (July-2021)	2	CO1
5.	Explain Black body radiation(Sep-2020)	2	CO1
	10 MARKS QUESTIONS		
1.	Explain Black body radiation. Derive Planck's radiation law **(Sep-2021)**	2	CO1
2.	State and explain Photo electric effect **(Dec-2018)**	2	CO1
3.	Illustrate Davisson-Germer experiment which supports the existence of matter waves**.(JULY-2021)**	2	CO1
4.	Derive Schrodinger's time Independent wave equation for matter waves starting from wave function. **(July-2021)**	3	CO1
5.	What is Compton shift? Derive the expression for Compton shift**. (Dec-2018)**	3	CO1
6.	State and explain Photo electric effect and derive Einstein's photo electric equation. **(Dec-2018, July-2021)**	4	CO1
7**.**	State the basic postulates of Planck's quantum theory and determine the energy density of a black body radiation. **(Sep-2021)**	3	CO1
8	Explain de-Broglie matter waves for a particle. **(July-2021)**	2	
9	Photo electric effect is a frequency dependent phenomenon and not intensity dependent one explains. **(Dec-2018, July-2021**)	2	CO1

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S.No.	Unit -II : SEMICONDUCTOR PHYSICS	BT Level	Course Outcome
	4 MARKS QUESTIONS		
1.	Explain carrier generation and recombination process in semiconductors(Sep-2021)	2	CO2
2.	Distinguish diffusion and drift of charge carriers in semiconductors. (July-2021, Sep-2020)	2	CO2
3.	Explain zener diode as voltage regulator (Dec-2018)	4	CO2
4.	Explain the Avalanche diode (Sep-2021)	2	CO2
5.	Distinguish between intrinsic and extrinsic semiconductor(Sep-2021)	2	CO2
6.	Explain the significance of hall coefficient. (Dec-2018, Nov-2020)	1	CO2
	10 MARKS QUESTIONS		
1	Distinguish between intrinsic and extrinsic semiconductor (Sep-2021)	2	CO2
2.	Deduce an expression for Density of electrons in the conduction band of an intrinsic semiconductor.(May-2019)	5	CO2
3.	State Hall Effect. Derive Hall coefficient for a semiconductor and write its applications.(Dec-2018, Nov-2020)	2	CO2
4.	Deduce an expression for density of holes in the valence band of an intrinsic semiconductor. (July-2021)	5	CO2
5.	Deduce an expression for majority charge carriers in p-type semiconductor. (Nov-2020)	2,5	CO2
6.	Explain the variation Fermi level with temperature in intrinsic and extrinsic semiconductors. (Sep-2021)	2	CO2
7.	Deduce an expression for majority charge carriers in n-type semiconductor.(Dec-2018)	2,5	CO2
8	What is p-n junction diode? Explain V-I characteristics of p-n junction diode	2	CO2
9	Explain the construction and working of Bipolar Junction Transistor (BJT). (Nov-2020,July-2021,Sep-2021)	2	CO2
10	Explain the Avalanche and Zener Breakdowns in PN junction diode(July-2021)	2	CO2

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	QUESTION BANK	**Rev1:**
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Faculty Name & Designation	**N Shailaja/ Dr. P Balasubramanyam/E Bala Raju/Ashok Kumar CH**	

S.No.	Unit -III : OPTO ELECTRONICS	BT Level	Course Outcome
	4 MARKS QUESTIONS		
1.	Write a short note on radiative recombination mechanism in semiconductors(Dec-2018)	1	CO3
2.	Discuss the working of Avalanche of photo diode.(July-2021, Sep-2021)	1	CO3
3	Explain the principle of LED(Dec-2018, Nov-2020,July-2021)	2	CO3
4.	Write a short note on Solar cell(Dec-2018,July-2021, Sep-2021)	2	CO3
5	Explain the working of semiconductor laser diode(Dec-2018, Nov-2020)	2	CO3
	10 MARKS QUESTIONS		
1.	Distinguish between direct and indirect band gap semiconductors. (Dec-2018,June-2019, Nov-2020)	2	CO3
2	Write the characteristics of a PIN diode. Explain its working.(Nov-2020)	2	CO3
3.	Explain the construction and working of LED(Dec-2018, Nov-2020,July-2021)	2	CO3
4	Discuss the working of Semiconductor Laser. (Dec-2018, Nov-2020)	2	CO3
5	Explain working principle of Solar cell. Draw and explain V-I characteristics of a solar cell. (Dec-2018,July-2021, Sep-2021)	2	CO3
6	Define Avalanche Break down and the working of Avalanche photo diode.(July-2021, Sep-2021)	4	CO3
	Unit-IV LASERS & FIBER OPTICS		
	4 MARKS QUESTIONS		
1.	Explain the lasing action (May-2019)	2	CO4
2.	Define Acceptance angle and Acceptance cone (Dec-2018)	2	CO4
3.	Explain the principle of optical fiber (July -2021)	1	CO4
4.	Write the applications of lasers (Dec-2020)	1	CO4
5.	Explain characteristics of Lasers (Sep-2021)	1,2	CO4
6.	Define population inversion, pumping mechanism, meta stable state(Dec-2018)	2	CO4

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S.No.		BT Level	Course Outcome
	10 MARK QUESTIONS		
1.	Explain the interaction of radiation with matter (July-2021)	2	CO4
2.	Discuss the construction and working of a Ruby laser. (Dec-2018)	2	CO4
3.	How lasing action is achieved in He- Ne gas laser. Explain. (Nov-2020,Dec-2020,July-2021)	2	CO4
4.	Explain the construction and working of Carbon Dioxide laser (CO_2 Laser)(July-2021)	2	CO4
5.	Define Acceptance angle and Acceptance cone. Deduce the expression for acceptance angle and numerical aperture for an optical fiber. (dec-2018, Nov-2020,Sep-2021))	2,4	CO4
6.	Categorize the applications on lasers in various fields. (July-2021)	2	CO4
7.	Explain losses associated with optical fibers.(July-2021)	2	CO4
8	Explain the types of optical fibers.(Sep-2021)	4	CO4
9	Write short note population inversion, pumping mechanism, meta stable state(Dec-2018)	2	CO4

Sub. Code & Title		R20EAP1101 & APPLIED PHYSICS		
Academic Year: 2021-22		Year/Sem./Section	I/I – ECE-A,B,C & D	
Faculty Name & Designation		N Shailaja/ Dr. P Balasubramanyam/E Bala Raju/Ashok Kumar CH		

Unit-V: ELECFROMAGNETISM & PROPERTIES OF MAGNETIC MATERIALS

4 MARKS QUESTIONS

1.	Define the terms i) Permeability ii) Susceptibility iii) Magnetization iv) Magnetic moment (Dec-2018)	2	CO5
2.	Define electric current. Explain continuity equation (Sep-2021)	1	CO5
3.	State the laws of electrostatics.(Nov-2020)	1	CO5
4.	Define i) dielectric constant ii) dielectric susceptibility iii) polarization (Nov-2020)	1	CO5
5.	State and explain Amperes law and Faradays law (Nov-2020)	1	CO5
6.	Write a short note on Hysteresis? (Sep-2021)	2	CO5
7.	Write the applications of magnetic materials.(Sep-2021)	2	CO5

10 MARK QUESTIONS

1.	State and explain Maxwell's equations and express them in differential form. (Dec-2018 , Nov-2020)	4	CO5
2.	Explain how the dielectric constant of a ferroelectric crystal varies with temperature(Nov-2020)	2	CO5
3.	Explain the different contributions for the formation of domains in a ferromagnetic material.(Dec-2018)	3	CO5
4	Deduce an expression for Internal field in a solid (Nov-2020)	2,5	CO5
5.	Explain the classification of magnetic materials with examples (May-2019)	1,2	CO5
6.	Derive Clausius-Mossotti relation (May-2019)	5	CO5
7.	Give an account on domain theory of ferromagnetism(Dec-2018,Nov-2020)	3	CO5
8	Explain the phenomena of Ferro electricity and peizo electricity(Dec-2018)	2	CO5

Subject Code: R20EAP1201

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)
Recognized under 2(f) and 12(B) of UGC Act 1956
I B.Tech – I Semester Model Question Paper
APPLIED PHYSICS
(Electronics & Communication Engineering)

Duration: 3 Hrs   Max Marks: 70M

Section - A

Answer _All_ the following questions   **Marks: 5Qx4M = 20M**

1. Explain de Broglie concept of matter waves.

2. Discuss Fermi level dependence on temperature in intrinsic semiconductor

3. Write a short note on radiative and non-radiative recombination mechanism in semiconductors.

4. What is population inversion and how does it achieve? Explain.

5. Write note on Ferro electricity.

Section - B

Answer any _FIVE_ questions choosing at least one from each Unit

Marks: 5Qx10M = 50M

UNIT - I

6. Discuss photo electric effect and derive the Einstein photo electric equation.

(OR)

7. Write down the Schrodinger's wave equation for a particle in a box. Solve it to obtain eigen function and show that Eigen values are discrete.

UNIT - II

8. Derive an expression for carrier concentration in an n-type semiconductor.

(OR)

9. Explain the Hall effect in metal? Derive the formulae to determine hall coefficient and mobility of electrons.

UNIT - III

10. Explain with neat diagram, the construction and working of solar cell. State few disadvantages of solar cell.

(OR)

11. What is an LED? Explain the construction and working of LED.

UNIT - IV

12. a) Describe the construction and working of Ruby laser with relevant energy level diagram.
    b) Explain in detail applications of lasers in various fields.

(OR)

13. a) Define acceptance angle of an optical fiber and derive an expression for it in terms of

    refractive indices of the core and cladding.

    b) Find the numerical aperture and acceptance angle of a fiber with core of index 1.4 and
    fractional refractive index change of 0.02.

UNIT - V

14. a) State and explain Maxwell's equations and express them in differential form.
    b) Explain how the dielectric constant of a ferroelectric crystal varies with temperature.

(OR)

15. Explain the different types of magnetic material.

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BR-18
Subject Code: Rl8EAP1201

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

Recogruzed under 2(f) and 12(B) of UGC Act1956

I **B.Tech -I** Semester -End Examinations (Regular) December - 2018

APPLIED PHYSICS

(Electronics & Communication Engineering)

Duration: 3 Hrs   **21.12.2018**   **Max Marks: 70M**

Section -A

Answer _All_ the following questions   **Marks: 5Qx4M =20M**

1. Explain photoelectric effect in brief.

2. Discuss Fermi level dependence on temperature.

3. Write a short note on radiative recombination mechanism in semiconductors.

4. What is population inversion and how does it achieve? Explain.

5. State and explain Ampere's and Faraday's laws.

tion – B

Answer any _FIVE_ questions choosing at least one from each Unit

Marks: SQxlOM = SOM

UNIT - I

6. Discuss Compton effect an d derive the expression for Compton shift.

(OR)

7. Write down the Sc hrodinger's wave equatIon for a pa1ticle in a box. Solve it to obtain eigen function and show th at Eigen values a.·e discrete.

UNIT-II

8. Derive an expression for carrier concentrat ion in an a-type semiconducto r.

(OR)

9. Explain the Hall Effect in metal? Derive the formulae to determine hall coefficient and mobility 0f electrons.

UNIT- III

10. Explain   eat diagram, the construction and working of solar cell. State few disadvantages of solar cell.

(OR)

11. hat is an LED? Explain the construction and working of LED.

UNIT-IV

12. a) Describe the construction and working of Ruby laser with relevant energy level diagram.
b) Explain in detail applications of lasers in various fields.

(OR)

13. a) Define acceptance angle of an optical fiber and derive an expression for it in terms of refractive indices of the core and cladding.

   b) Find the numerical aperture and acceptance angle of a fiber with core of index 1.4 and fractional refractive index change of 0.02.

UNIT-V

14. a) State and explain Maxwell's equation express them in differential .
    b) Explain how the dielectric constant of a fen-oelectric crystal varies · h te rature.

(OR)

15. Explain the different contributions for the formation of domains in a ferromagnetic aterial.

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BR-18   SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY   **D4**

(An Autonomous Institution Under 2(1) and 12(B) ofUGC Act 1956, New Delhi)

I B.Tech - I Semester - I Mid Term Examinations, September ____ 8

(Rl8EAP1101) APPLIED PHYSICS - **(Electronics & Communicatio n Engineering)**

Duration: 90Mins _____ I Da - AN _____ **Max Marks: 25M**

Section - A

Answer _All_ the questions   **Marks: 5Qx1M = 5M**

I. Write the equation for de Broglie's wavelength.

2. State Heisenberg's uncertainty Principle.

3. What is semiconductor? Write the types ofsemiconduc   s.

4. Define n-t ype semiconduc tor.

5. What is non-radiative recombination?

Section – B

Answer any _FOUR_ questions   **Marks: 4Qx5M = 20M**

6. What is Compton shift? Derive the expres sion for Compton shift.

7. Obtain Schrodinger's time **Independ lelfiljllilllillf**ve equation for matter waves.

8. Deduce an expression for Density of electrons in the conduction band of an intrinsic

9. Explain the principle and constr uction of BJT.

10. Deduce an expression for ma ·1ty charge carriers in p-type semiconductor.

11. Explain V-1 characteristi   ofL ED.

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PROGRAMMING FOR PROBLEM SOLVING

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)

B.Tech. - I Year – I Semester

L	T	P	C
3	1	0	4

(R20CSE1101) PROGRAMMING FOR PROBLEM SOLVING

Course Objectives:
a) To learn the fundamentals of computers.
b) To understand the various steps in program development.
c) To learn the syntax and semantics of C programming language.
d) To learn the usage of structured programming approach in solving problems.

Course Outcomes: The student will learn
a) To write algorithms and to draw flowcharts for solving problems.
b) To convert the algorithms/flowcharts to C programs.
c) To code and test a given logic in C programming language.
d) To decompose a problem into functions and to develop modular reusable code.
e) To use arrays, pointers, strings and structures to write C programs.
f) Searching and sorting problems.

Unit - 1: Introduction to Algorithms and Programming, Arrays
Introduction to Algorithms: steps to solve logical and numerical problems. Representation of Algorithm, Flowchart/Pseudo code with examples, Program design and structured programming
Algorithms for finding roots of quadratic equations, finding minimum and maximum numbers of a given set, finding if a number is prime number, etc.
Introduction to C Programming Language: variables (with data types and space requirements), Syntax and Logical Errors in compilation, object and executable code , Operators, expressions and precedence, Expression evaluation, Storage classes (auto, extern, static and register), type conversion, The main method and command line arguments Bitwise operations.
Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branching with if, if-else, switch-case, ternary operator, goto, Iteration with for, while, do-while loops
Arrays: one and two dimensional arrays, creating, accessing and manipulating elements of arrays

Unit - II: Strings, Structures and Functions:
Strings: Introduction to strings, handling strings as array of characters, basic string functions available in C (strlen, strcat, strcpy, strstr etc.), arrays of strings
Structures: Defining structures, initializing structures, unions, Array of Pointers: Idea of pointers,
Functions: Designing structured programs, Declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value, Passing arrays to functions, passing pointers to functions, idea of call by reference, Some C standard functions and libraries

Unit - III: Pointers and Dynamic Memory Allocation:
Command line arguments
Recursion: Simple programs, such as Finding Factorial, Fibonacci series etc., Limitations of Recursive functions
Defining pointers, Pointers to Arrays and Structures, Use of Pointers in self-referential structures, usage of self referential structures in linked list (no implementation) Enumeration data type
Dynamic memory allocation: Allocating and freeing memory, Allocating memory for arrays of different data types

Unit - IV: Preprocessor and File handling in C:
Preprocessor: Commonly used Preprocessor commands like include, define, undef, if, ifdef, ifndef
Files: Text and Binary files, Creating and Reading and writing text and binary files, Appending data to existing files, Writing and reading structures using binary files, Random access using fseek, ftell and rewind functions.
I/O: Simple input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout and stderr.

Unit - V: Searching and Sorting:
Basic searching in an array of elements (linear and binary search techniques),
Basic algorithms to sort array of elements (Bubble, Insertion and Selection sort algorithms), Basic concept of order of complexity through the example programs

TEXT BOOKS:
a) Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
b) B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)

REFERENCE BOOKS:
a) Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
b) R.G. Dromey, How to solve it by Computer, Pearson (16th Impression)
c) Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
d) Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition
e) E. Balaguruswamy, Programming in ANSI C, Tata McGraw - Hill

SRI INDU COLLEGE OF ENGG & TECH
LESSON PLAN
(Regulation :R20)
Department of Electronics & Communication Engineering

Prepared on :07/10/2021

Sub. Code & Title		(R20CSE1101) PROGRAMMING FOR PROBLEM SOLVING		
Academic Year:2021-22		Year/Sem./Section	I-I/A,B	
Faculty Name & Designation		D.MOUNIKA Asst.professor		

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
	UNIT-I							
I	**Introduction to Algorithams and Programming,Arrays**					**19**		
1.1	Introduction to Algorithams,Steps to solve logical and numerical problems	T2	1.25	1.25	Black board	1		CO1/L1
1.2	Steps to solve logical and numerical problems,Representation of Algoritham with examples	T2	1.26	1.26	Black board	2		CO1/L4
1.3	Flowchart/Psuedo code with examples	T2	1.26	1.36	Power Point Presentation			CO1/L1
1.4	Program design and Structured Programming	T1	102	109	Power Point Presentation	1		CO3/L1
1.5	Algorithams for i)Finding roots of Quadratic Equations ii) Finding minimum and maximum numbers of given set iii)Finding if a number is prime number.	T2	1.25	1.26	Black board, Power Point Presentation	1		CO1/L4
1.6	Introduction to C Programming Language	T1	7	9	Power Point Presentation	1		CO3/L1
1.7	Variables(with datatypes and Space requirements)	T1	26	32	Nptel video lecture	1		CO3/L1
1.8	Syntax and Logical Errors in Compilation,Object and Executable Code	T1	109	110	Black board	1		CO3/L4
1.9	Operators	T1	46	61	Black board	2		CO3/L2
1.10	expressions and precedence, Expression evaluation,	T1	38	40	Black board	1		CO3/L5
1.11	Storage classes (auto, extern, static and register), type conversion	T2	2.44	2.53	Power point presentation	1		CO3/L2
1.12	The main method and command line arguments Bitwise operations	T2	3.37	3.39	Black board	1		CO3/L3
1.13	Conditional Branching and Loops	T1	122	123	Black board	1		CO3/L2

SRI INDU COLLEGE OF ENGG & TECH
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Academic Year:2021-22	Year/Sem./Section	I-I/A,B
Faculty Name & Designation	D.MOUNIKA Asst.professor

Unit/Item No.	Topic(s)	Book Reference	Page(s)		Teaching Methodology	Proposed No.of Periods	Actual Date of Handled	CO/RBT
1.14	Writing and evaluation of conditionals and consequent branching with if, if-else, switch-case	T2	5.2	5.42	Black board	1		CO3/L2
1.15	go to,Iteration with for, while, do-while loops	T1	6.2	6.9	Black board	2		CO3/L2
1.16	Write a c program i) to read 10 numbers from keyboard and find their sum andaverage ii)to display multiplication of table of a given integer	T1	164	168	Black board			CO3/L6
1.17	Arrays: one and two dimensional arrays,	T2	7.2	7.4	Power point presentation	1		CO5/L1
1.18	creating, accessing and manipulating elements of arrays	T2	7.5	7.36	Black board	1		CO5/L3
1.19	Rivision				Black board	1		

	Review		Signature of the HOD/Coordinator			

Unit/Item No.	Topic(s)	Book Reference	Page(s)		Teaching Methodology	Proposed No.of Periods	Actual Date of Handled	CO/RBT
				UNIT –II				
II	**Strings,Structures and Functions**					15		
2.1	Strings: Introduction to strings, handling strings as array of characters	T2	8.2	8.7	Black board	1		CO5/L1
2.2	Basic string functions available in C (strlen, strcat, strcpy, strstr etc.), arrays of strings	T2	8.21	8.39	Black board	1		CO5/L1
2.3	Structures: Defining structures, initializing structures	T2	9.7	9.21	Black board			CO5/L1
2.4	Unions	T2	9.22	9.24	Black board	2		CO5/L1
2.5	Write a c program i) to read and print an employees details using structure ii)to append one string to end of the string iii)to calculate the difference between two timeperiods using union	T2	9.25	9.26	Black board			CO5/L6
2.6	Array of Pointers: Idea of pointers,	T1	304	310	Black board	1		CO5/L2
2.7	Functions: Designing structured programs	T1	174	175	Black board	1		CO4/L1
2.8	Declaring a function, Signature of a function,	T1	176	183	Black board	1		CO4/L1
2.9	Parameters and return type of a function	T2	15.20	15.24	Power point presentation	1		CO4/L2

	SRI INDU COLLEGE OF ENGG & TECH **LESSON PLAN** **(Regulation :R20)** **Department of Electronics & Communication Engineering**		**Prepared on :07/10/2021**	

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Faculty Name & Designation	**D.MOUNIKA Asst.professor**

2.10	Passing parameters to functions, call by value,	T2	15.24	15.28	Power point presentation	1		CO4/L1
2.11	Passing arrays to functions	T1	248	258	Black board	1		CO4,CO5/L3
2.12	passing pointers to functions	T1	284	291	Black board	1		CO4,CO5/L3
2.13	Idea of call by reference	T2	15.46	15.48	Black board	1		CO4,CO5/L1
2.14	Some C standard functions and libraries	T1	228	229	Power Point Presentation	1		CO4/L1
2.15	Revision				Black board	1		
	Review				**Signature of the HOD/Coordinator**			

UNIT- III								
III	**Pointers and Dynamic Memory Allocation**					**13**		
3.1	Command line arguments	T2	3.37	3.39	Power point presentation	1		CO5/L2
3.2	Recursion: Simple programs	T1	193	194	Black board	1		CO4/L2
3.3	Finding Factorial, Fibonacci series etc, Limitations of Recursive functions using recursion	T1	194	195	Black board	1		CO4/L3
3.4	Towers of Hanoi problem	T1	196	199	Model Presentation	1		CO4/L2
3.5	Defining pointers, Pointers to Arrays and Structures	T1	10.1	10.14	Black board	2		CO5/L1
3.6	Use of Pointers in self-referential structures,	T2	370	371	Black board	1		CO5/L2
3.5	Usage of self referential structures in linked list (no implementation)	T1	371	372	Power point presentation	1		CO5/L2
3.7	Enumeration data type	T1	450	455	Black board	1		CO3/L1
3.8	Dynamic memory allocation,Allocating and freeing memory	T1	294	296	Black board	2		CO5/L2
3.9	Allocating memory for arrays of different data types	T1	296	298	Black board			CO5/L3
3.10	Revision				Black board	1		
	Review							

SRI INDU COLLEGE OF ENGG & TECH
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Department of Electronics & Communication Engineering

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Faculty Name & Designation	**D.MOUNIKA Asst.professor**

							Signature of the HOD/Coordinator	
UNIT-IV								
IV	**Preprocessor and File Handling in C**					**10**		
4.1	Preprocessor: Commonly used Preprocessor commands like include, define, undef, if, ifdef, ifndef	T1	458	466	Black board	1		CO3,5/L1
4.2	Examples on preprocessor commands	T1	467	469	Black board	1		CO3,CO5/L6
4.3	Files :Text and Binary files, Creating and Reading and writing text and binary files, Appending data to existing files	T1	399	407	Black board	2		CO3,CO5/L1
4.4	Writing and reading structures using binary files,	T1	412	417	Black board	1		CO3,CO5/L2
4.5	Random access using fseek, ftell and rewind functions.	T1	418	419	Black board	1		CO3,CO5/L2
4.6	I/O: Simple input and output with scanf and printf, formatted I/O	T2	13.9	13.31	power point presentation	2		CO3,CO5/L2
4.7	Introduction to stdin, stdout and stderr.	T2	13.31	13.32	Black board	1		CO3,CO5/L2
4.8	Rivision				Black board	1		
Review		Signature of the HOD/Coordinator						
UNIT-V								
V	**Searching and Sorting**					**09**		
5.1	Basic searching in an array of elements (linear and binary search techniques	T2	16.16	16.26	Black board	3		CO6/L2
5.2	Basic algorithms to sort array of elements (Bubble, Insertion and Selection sort algorithms),	T2	16.1	16.15	Black board	3		CO6/L2
5.3	Basic concept of order of complexity through the example programs	T2	16.1	16.26	Black board	2		CO6/L2
5.4	Revision				Black board	1		
Review			Signature of the HOD/Coordinator					

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning,(3rd Edition)

REFERENCE BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice HallofIndia
2. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression)
3. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
4. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition
5. E. Balaguruswamy, Programming in ANSI C, Tata McGraw – Hill

Weblinks

w-1. **https://nptel.ac.in/courses/106/105/106105171/**

w-2 **https://onlinecourses.nptel.ac.in/noc21_cs01/preview**

w-3 **https://nptel.ac.in/courses/106/104/106104074/**

https://www.coursera.org/specializations/c-programming

https://www.edx.org/course/c-programming-getting-started

SRI INDU COLLEGE OF ENGG & TECH
LESSON PLAN
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Department of Electronics & Communication Engineering

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CONTENT BEYOND THE SYLLABUS

S.No	Topics	Proposed Actions	Date	Resource Person/Mode	POs	PSOs
1	Introduction to components of Computer System	To get Knowledge		G.|uma maheshwari	PO1	PSO1
2	Introduction to Data Structures	To get knowledge		G.|uma maheshwari	PO2&PO3	-
3	strrev ,strlwr, strupr,strcmp functions	To get knowledge		D.mounika	PO3	-

ASSIGNMENT

S.No	Assignment Questions	Course Outcome	Books To be Referred	Date of Announcement	Date Of Submission
1	List the steps and draw flowchart to print biggest of three numbers.	CO1	T2	4-1-2022	18-1-2022
2	Explain branching statements with example.	CO3	T2	4-1-2022	18-1-2022
3	Explain string handling functions with an example.	CO5	T2	4-1-2022	18-1-2022
4	Explain Parameters and return types of function.	CO4	T2	4-1-2022	18-1-2022
5	Explain about recursive function with an example.	CO4	T2	4-1-2022	18-1-2022
6	Discuss about following with an example a)malloc b)calloc c)realloc d)free	CO5	T2	4-1-2022	18-1-2022
7	Develop a C program to combine contents of two files in to third file.	CO3	T2	4-1-2022	18-1-2022
8	Explain the purpose and usage of preprocessor directives.	CO3	T2	4-1-2022	18-1-2022
9	Explain Binary search technique with example.	CO6	T2	4-1-2022	18-1-2022
10	Choose any one of the sorting technique and sort the following numbers 34,5,67,8,435,2,78,45,12,15,24	CO6	T2	4-1-2022	18-1-2022

SELF STUDY TOPICS

S.No.	Topics	Books & Journals	Course Outcomes
1	Implement copy one string to another string, concatenation of two strings, comparison of two string, reverse of two strings, length of a string with out using predefined function s.	Let Us C 8th Edition,BPB publications,yashvanth kanetkar	CO3,CO5
2	Pattern programs	The Complete Reference C Fourth edition McGraw – Hill,Herbert Schildt	CO3

Prepared by	Recommended and Approved by
(Signature & Name) D.MOUNIKA	HOD

Sub. Code & Title	(R20CSE1101) PROGRAMMING FOR PROBLEM SOLVING	
Academic Year: 2021-22	Year/Sem.	I-I/ECE (A,B,C,D)&MECH&CIVIL
Faculty Name & Designation	D.MOUNIKA Asst.professor	

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)
(1. Remembering 2. Understanding 3. Applying 4. Analyzing 5. Evaluating 6. Creating)

	UNIT-1 Introduction to Algorithms and Programming, Arrays		
	1 MARKS QUESTIONS	**BT Level**	**Course Outcome**
1.	Define Algorithm and write its characteristics.	1	CO1
2.	Define Flowchart.	1	CO1
3.	What is Pseudo code? Give example .(R18-**NOV**-**2020)**	1	CO1
4..	Discuss the structure of a C program. (JNTUH R16-**May**-**2016)**	6	CO3
5.	Compare Pre test and Post test loops with example. (JNTUH R18-**May**-**2019)**	4	CO3
6.	What are bitwise operators? Give example for each. (R20-**JULY**-**2021**)	1	CO3
7.	Compare Implicit and Explicit type conversion. (JNTUH R16-**AUG**-**2018)**	4	CO3
8	What is Conditional operator? Give example.	1	CO3
9	List types of arrays.	1	CO5
10	List and explain Unconditional Branching statements in C with example.	4	CO3
11	What is type casting? (R18-**May-2019/** JNTUH R18-**May-2019)**	1	CO1
12	What is an identifier? Classify following as valid or invalid identifier. Num1, $num1,+add.?(R18-**july-2021/**R20-**sep-2021)**	2	CO3
13	What is the purpose of diamond symbol in flowchart?Give an Example? (R18-**NOV**-**2020)**	2	
	10 MARKS QUESTIONS		
1.	List the steps to print biggest of three numbers (Algorithm). (R18-**May-2019/**R20-**july**-**2021)**	1	CO1
2.	Model a Flowchart to find the roots of a quadratic equation. . (R18-**Dec/Jan-2019)**	3	CO1
3.	Explain Conditional Branching statements with example .(R18-**May-2019/** R18-**july**-**2021)**	2	CO3
4.	Explain different operators available in C. (R18-**Dec/Jan-2019/**R20-**july-2021)**	2	CO3

5.	Develop a C program to multiply two matrices by checking the compatibility.	3	CO5
6.	Develop a C program to print the reverse of a given number.	3	CO3
7.	Explain Storage classes in detail. (R20-**july**-**2021**/ JNTUH R18-**May**-**2019**)	2	CO3
8	Explain different loops available in C with example .	2	CO3
9	Develop a C program to find maximum and minimum element in an array.	3	CO5
10	Develop a C program for an electricity power distribution company charges its domestic consumers as follows. Consumption Units Rate of Charge (per unit) 0-200 Rs. 5 201-300 Rs. 7 301-400 Rs. 8 Above 400 Rs. 10	6	CO3
11	Illustrate an algoritham and flowchart?write a C program to find sum of n numbers 1 to n? R18-**july**-**2021**)	6	CO3
12	Write an algorithm to loan a book from your college library? (R18-**NOV**-**2020**)	6	CO1
13	Write a C program to create a 3 dimensional array of size 2x3x4,read contents from user and print the contents on screen? (R18-**NOV**-**2020**)	6	CO5
14	Illustrate switch statement and write a program to perform arithmetic operations? (R20-**sep**-**2021**)	6	CO3
15	What is the precedence and associativity in an expression and what is their need?(JNTUH R18-**May**-**2019**)	2	CO3
	Unit -II : Strings, Structures and Functions		
	1 MARKS QUESTIONS		
1.	Define a String?	1	CO5
2.	Describe String Handling Functions.	2	CO5

	SRI INDU COLLEGE OF ENGG & TECH QUESTION BANK (Regulation :R20) Department of Electronics and Communication Engineering	(Regulation :R20) Prepared on :03/08/2021 Rev1: 07/10/2021 Page: 3 of 9
	Sub. Code & Title	**(R20CSE1101) PROGRAMMING FOR PROBLEM SOLVING**
	Academic Year: 2021-22	**Year/Sem.**	**I-I/ECE (A,B,C,D)&MECH&CIVIL**
	Faculty Name & Designation	**D.MOUNIKA Asst.professor**

3.	Define array of strings?	1	CO5
4.	Define a Structure with an example?	1	CO5
5.	Define a union with an example?	1	CO5
6.	Differentiate structure and union? (R18-**May-2019/**R18-**NOV**-**2020/** JNTUH R18-**May-2019)**	4	CO5
7.	Define a function. . (R18-**Dec/Jan-2019)**	1	CO4
8	What is the difference between call by value and call by reference?	4	CO4
9	Demonstrate some standard functions and libraries.	3	CO4
10	Write about function prototype and how parameters are passing to functions.	6	CO4
10 MARKS QUESTIONS			
1	Explain String handling functions with examples. (R18-**july**-**2021/**R18-**NOV**-**2020/**R20-**july-2021)**	2	CO5
2.	Define a structure. How to initialize a structure ?Explain with an example. (R18-**May-2019/**R18-**july-2021/** JNTUH R18-**May**-**2019)**	1	CO5
3.	Write a C program to process n students records.(R20-**sep-2021)**	6	CO5
4.	Write a c program that uses structures concept to perform addition of two complex numbers?	6	CO5
5.	Write a C program to find GCD of given integers using functions?	3	CO4
6.	Explain String Concatenation and write a C program to concatenate two strings?	2	CO5
7.	Write a C program to pass an array as an argument to function? (R20-**july-2021)**	3	CO4, CO5
8	Explain call by value and call by reference. Write both using a program to swap two values? (R18-**july**-**2021/**R20-**july-2021)**	3	CO4

	SRI INDU COLLEGE OF ENGG & TECH QUESTION BANK (Regulation :R20) Department of Electronics and Communication Engineering		(Regulation :R20) Prepared on :03/08/2021 Rev1: 07/10/2021 Page: 4 of 9
	Sub. Code & Title	(R20CSE1101) PROGRAMMING FOR PROBLEM SOLVING	
	Academic Year: 2021-22	Year/Sem.	I-I/ECE (A,B,C,D)&MECH&CIVIL
	Faculty Name & Designation	D.MOUNIKA Asst.professor	

9	Explain parameters and return types of a function. . (R18-**Dec/Jan-2019**/ R20-**july-2021**)	2	CO4
10	Write a non-recursive function to print Fibonacci series up to a given number.**(R18-NOV-2020)**	6	CO4
11	Explain about C standard functions and libraries. (R18-**May-2019**)	2	CO5
12	Write a C program to read and Multiple strings using Pointers? (R20-**sep**-**2021**)	6	CO5
Unit – III : Pointers and Dynamic Memory Allocation			
1 MARKS QUESTIONS			
1.	Define recursion? (R18-**May-2019**/R20-**july-2021**)	1	CO4
2.	What is a pointer? Give the syntax and example for declaration and Initialization.	1	CO5
3	Mention the similarities and differences between arrays and linked list.	4	CO5
4.	Explain about Enumeration data type?	2	CO3
5	How to access a variable through a pointer?	1	CO5
6.	Explain the usage of pointers in arrays?	2	CO5
7	Analyze the usage of pointers in self-referential structures? (JNTUH R16-**May**-**2019**)	4	CO5
8.	Apply pointers on structures.	3	CO5
9.	List the limitations of recursive function? (R18-**May-2019**)	4	CO4
10.	Discuss about initialization of pointer variables? (R18-**july**-**2021**)	6	CO5
11	What are the drawbacks of using pointer? (R18-**NOV**-**2020**)	1	CO5
12	Mention the similarities and difference between arrays and linked list? (R20-**july**-**2021**)	2	CO5
13	How does a recursive function differ from iterative function? ((JNTUH R18-**May**-**2019**)	2	CO4
10 MARK QUESTIONS			

1.	Explain about recursive function with an example?	2	CO4
2	Write a program to find factorial of a given number? (R18-**May-2019**/R18-**july-2021**/ R20-**sep-2021**)	3	CO3

3.	Classify the following
	    a) Pointers to arrays
	    b) Pointers to structure
		4	CO5

4	Explain about self-referential structures in linked list?	2	CO5
5.	Explain about dynamic memory allocation? (R18-**May-2019**)	2	CO5
6	Write a recursive function to print the numbers in Fibonacci series?(R18 **Dec/Jan-2019**/R18-**NOV-2020**/R20-**july-2021**)	3	CO4
7.	How to allocate memory for arrays of different data types? (R18-**May-2019**)	2	CO5
8.	Explain about command line arguments with an example? (R18-**Dec/Jan-2019**/R18-july—**2021**/ JNTUH R18-**May-2019**)	2	CO5
9.	How will you recognize pointer to pointer? What does the number of *s indicate?	1	CO5

10.	Discuss about the following with an example . (R18-**Dec/Jan-2019**/R18-**NOV-2020**/R20-**july-2021**)
	    a) malloc()
	    b) calloc()
	    c) realloc()
	    d) free()
		6	CO5

11	Write a C program to read unknown number of integers as command line arguments and print their average? (R18-**NOV-2020**)	6	CO5
12	Summarize the concept of aray of pointers with example? (R20-**sep-2021**)	2	CO5
Unit-IV : Preprocessor and File handling in C			
1 MARKS QUESTIONS			

1.	Define preprocessor? Explain about preprocessor commands?	1	CO3
2.	Define file? Explain types of files? (JNTUH R18-**May**-**2019)**	1	CO3
3.	How to append one file at the end of the other? Explain with an example.	1	CO3
4.	Design a solution to implement user defined header file?	6	CO3
5.	Distinguish between text mode and binary mode operation of a file?	4	CO3
6.	What is the difference between macro and function? (R18-**NOV**-**2020)**	1	CO3
7.	What is the use of fseek()? Explain its syntax.	1	CO3

8	Distinguish between the following functions.
	
	    a. scanf() and fscanf()
	    b. getc() and getchar()
	    c. putc() and fputc()
	    d. putw() and getw()
	    e. ferror() and perror()
	    f. feof() and eof()
		4	CO3

9	Why the header file stdio.h be frequently used in C language? (R20-**sep**-**2021)**	1	CO3

10	Distinguish between the following modes
	
	    a. w and w+
	    b. r and r+
	    c. rb and rb+
	    d. a and a+
		4	CO3

	10 MARK QUESTIONS		
1.	Develop a C program to display contents of file on the screen.	3	CO3
2.	Develop a C program to combine contents of two files in a third file and display the data from third file.	3	CO3

	SRI INDU COLLEGE OF ENGG & TECH QUESTION BANK **(Regulation :R20)** Department of Electronics and Communication Engineering		**(Regulation :R20)** Prepared on :03/08/2021 Rev1: 07/10/2021 **Page: 7 of 9**
	Sub. Code & Title	**(R20CSE1101) PROGRAMMING FOR PROBLEM SOLVING**	
	Academic Year: 2021-22	**Year/Sem.**	**I-I/ECE (A,B,C,D)&MECH&CIVIL**
	Faculty Name & Designation	**D.MOUNIKA Asst.professor**	

3.	Develop a C program to write contents of one file in reverse into another file? (R18-**NOV-2020)**	3	CO3
4.	Explain about types of files with an example?	2	CO3
5.	Explain about Random Access using fseek, ftell, and rewind functions? (R18-**july-2021**/R20-**july-2021)**	2	CO3
6.	How to create and store files using C language?	1	
7.	Explain the purpose and usage of preprocessor directives. (R18-**july-2021**/R20-**july-2021/** R20-**sep-2021)**	1	
8.	Explain about stdin, stdout & stderr functions? (R18-**May-2019/**R18-**NOV-2020)**	2	
9	Explain about formatted Input/Output with an example?	2	
10	Compare I/O operations on text file and binary file using structures? (R20-**july-2021)**	5	
11	Develop a C program to copy contents of one text file to another file.? (R18 **Dec/Jan-2019)**	3	CO3
12	Write a C program for creating and reading text in to file? (R18-**May-2019)**	3	CO3
Unit-V: Searching and Sorting			
1 MARKS QUESTIONS			
1.	Give the merits and demerits of linear and binary search. (R20-**july-2021)**	1	CO6
2.	Define Searching.	1	CO6
3.	Define sorting. Give any 2 real time applications of it.	1	CO6
4.	Explain Searching Techniques.	2	CO6
5.	Define Complexity.	1	CO6
6.	Arrange the following elements in ascending order using Bubble sort. **12, 40, 3, 13, 47** .	6	CO6
7.	Write the complexity of the Linear &Binary search.	3	CO6

8.	Write the complexity of Bubble sort, insertion sort and selection sort. (R18-**May-2019**)	3	CO6
9.	Explain Big Oh Notation.	2	CO6
10.	Differentiate time and space complexity.	4	CO6
11	Enlist the types of sorting available in C? (R18-july-**2021**)	2	CO6
12	What is sorting ? Give any 4 real time applications. (R18-**NOV-2020**)	1	CO6
10 MARK QUESTIONS			
1.	Explain Linear search technique with example. (R18-**july-2021**)	2	CO6
2.	Explain Binary search technique with example. (R18-**july-2021**)	2	CO6
3.	Write a C program on Bubble sort. (R18-**Dec/Jan-2019/**R20-**july-2021**)	3	CO6
4	Write a C program on Insertion sort.	3	CO6
5.	Write a C program on Selection sort.and Explain with an example? (R18-**May-2019/** R18-**july-2021/**R18-**NOV-2020**)	3	CO6
6.	Explain Order ofComplexity.	2	CO6
7.	Choose any one of the sorting technique and Sort the following numbers 34, 5, 67, 8, 435, 2,78,45,12	6	CO6
8	Explain efficiency of linear search.	2	CO6
9	Define Linear Search? Write a C program on Linear search? (R20-**sep-2021**)	1	CO6
10	Define Binary Search ? write a C program on Binary search? (R18-**May-2019/**R20-**sep-2021**)	1	CO6

11	Outline searching and sorting? (R18-**july-2021)**	2	CO6
12	Which one among linear search and binary search technique is faster? Why? Justify your answer with proof? (R18-**NOV**-**2020)**	4	CO6
13	Illustrate the order of complexity of Selection sort algorithm through example? (R20-**july-2021)**	1	CO6

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)(Recognized under 2(f) and 12(B) of UGC Act 1956)
I B.Tech - I Semester –Model Paper
(R20CSE1101) PROGRAMMING FOR PROBLEM SOLVING
(Common to ECE&MECH&CIVIL)

Duration:3 Hrs   **Max Marks:70M**

Section – A

Answer all the following questions.   **Marks: 5Qx4M =20M**

1. Explain about typecasting?
2. Describe Pointer to structure with example?
3. What is the use of fseek() explain?
4. Explain any four differences between call by value and call by reference?
5. What is sorting?give any 4 real time applications of it?

Section – B

Answer _FIVE_ questions from the following

                                                                                          Marks: 5Qx10M = 50M

1 a) Describe array of structure with suitable example?
1 b) Describe about storage classes with suitable example?

(OR)

2 a.)Explain about conditional branching in c?
2 b) Develop a c program multiply two matrices by checking the compatability?

3 a).Demonstrate how one structure can be copied to another of the same type?
3 b) write a c program to prime numbers up to given number n?
(OR)

4 a) .write a c program to append a string to the end of other string by without using string
      manipulation function?
4b) Explain strcmp(), strrev(),struppr(),strlower()?

5 a) Explain commandline arguments briefly with example?
5 b) How to use pointer as argument in function explain with example?

(OR)

6. a) write a c program to create an array of integers with a user specified size (dynamic)read contents into
      and increases its size(reallocate size) by 5 whenever it is full.
6 b) In what way recursive function differs from non recursive functions? example?

7a) Explain the purpose and usage of preprocessor directives? explain macro inclusion?

7.b) Distinguish between following functions
a) scanf() and fscanf()   b)getc()and getchar()   c)putc() and fputc()
d)ferror() and perror()   e)feof() and eof()

(OR)

8 a) Write a c program to combine content of two files in to third file?
8 b) Demonstrate the following operations using example
a)fwrite( )   b) fgets()   c)fprintf() d)frewind()   e)ftell()
8c)How to print table of a number on output screen as well as in file using filehandling.

9.a. write a c program for linear search and binary search? Give the merits and demerits of each?

(or)

10 a) choose any one of the sorting technique and sort the following numbers and tracr
34,5,67,8,435,2,78,45,12,64,30,1
10 b) explain time and space complexity?

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)(Recognized under 2(f) and 12(B) of UGC Act 1956)
I B.Tech - I Semester –Model Paper
(R20CSE1101) PROGRAMMING FOR PROBLEM SOLVING
(Common to ECE&MECH&CIVIL)

Duration:3 Hrs   **Max Marks:70M**

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2. Describe Pointer to structure with example?
3. What is the use of fseek() explain?
4. Explain any four differences between call by value and call by reference?
5. What is sorting?give any 4 real time applications of it?

Section – B

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                                                                                          Marks: 5Qx10M = 50M

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1 b) Describe about storage classes with suitable example?

(OR)

2 a.)Explain about conditional branching in c?
2 b) Develop a c program multiply two matrices by checking the compatability?

3 a).Demonstrate how one structure can be copied to another of the same type?
3 b) write a c program to prime numbers up to given number n?
(OR)

4 a) .write a c program to append a string to the end of other string by without using string
      manipulation function?
4b) Explain strcmp(), strrev(),struppr(),strlower()?

5 a) Explain commandline arguments briefly with example?
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(OR)

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d)ferror() and perror()   e)feof() and eof()

(OR)

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34,5,67,8,435,2,78,45,12,64,30,1
10 b) explain time and space complexity?

EXTERNAL EXAM PREVIOUS QUESTION PAPER

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. What is a self-referential structJrc?Explnin.

J Present the ndvantnges of d) nanuc mem f) nJlocation.

4 E.\.phun the purpose nnd u ngc of ftcll nnd rewindfunctions.

What is time complc\it)" Ho\\ r\ 1 *ed* and expressed? ,

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UNIT - I •   \ •

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(OR)

7 What are storage clnssl' ? Explain the nu.₁ Qf static and extern storageclassse \\I th sunable programmins cxnmplc s

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11. wn:e i**C** progl'illZl**k** aeate an arr1*f* of lnte er ii user specined s ze (dynam c), read contents rto t, and ncn**M** e tts size (re allocate size) by S · "" · ţ s · ull.

1, '\IT – IV

12 E**p** lań the purpose and **usage** of preproce · r · · · s • fdef and lIrdef

(OR)

J.J Write **a** Cpr o gram to CC<ld an emntl **adcr,** · scr using scanf functlon The code should accept only emails nddres cs wid tore user name and domain name separateI) [f.g lf user Sllpp**ei** s ʼ1 l abc.com us cmamc **"ill**l:'C · ·1ain name is nbc coml

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J4. Pre cnt algorithms for linear search **and** :... . Gi\'e the mcnts and demerits of each.

(O R)

15 . Write a C program for implementinginsert. usorithm.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

| B. **Tech** | Semester - End Examinations (Regular/Suppl.) Dec/Jan-2019-20
R18CSE1101- PROGRAMMJNG FOR PROBLEM SOLVING
(Common to Civil,Mecb & ECE)

Duration: **3 Hrs**   30.12.2019   ~~Max Mark5: 70M~~

Section -A

Answer _All_ the following questions   **Marks: 5Qx4M = 20M**

J. Draw the flowchart for finding roots of quadratic equation.
2. Write the difference between strcpyQ & strcmpQ.
3. Define pointer & ,wite its applications.
4. Explain about the file input &output functions with syntax.
5. Differentiate Linear Search and Binary Search.

Section -B
Answer any _FIVE_ questions by choosing at least one from -
         M.a : 5Qx10M=50M

UNIT-I
6. Explain the different types of operators in C language with examples

(OR)

7. a) Write a C program to find the gTcatest ofthre,"""li?"hi. ers.
b) Write a C program to perfonn Addition of mlltri'lllll

8. a) Write a C program _to_ print empl o using union.
b) Dofin, fim,tioo? E,pl n lb, di ˙˙ntfunotion.

9. a) _Explain_ the process of dee); """'-::::rite aCprogram using i)gets ii) getcbar.
b) Explain the different cat ctions for ample(function with no arguments & no return value).

UNIT-ill

JO. a)Write a C pro to fftustrate the use of indirection operator'*' to access the value pointed bv program.
b) Write v program for fibonacci series.

(OR)

11. a) Explain the runic memory allocation functions.
b) What _is_ a command line argument and give an example?

UNIT-IV

12.a) Explain the various preprocessor commands in C.
b) Write a Cprogram to copy contents of one text file to another text file.

(OR)

13. _Explain_ the different types of files & wrHe a program to illustrate the error handling on fil

UNIT-V

14.Explain bubble sort with the algorithm or with a Cprogram.

(OR)

15. Explain the different searching and sorting techniques with ex81Jlple.

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi.) - Recognized under 2(f) and 12(B) of UGC Act 1956.

I B.Tech I Semester (REGULAR) End Examinations July - 2021
PROGRAMMING FOR PROBLEM SOLVING
(Common to CIVIL, MECH and ECE)

13/07/2021   Day - 3 (FN)
Duration: 3 Hrs   Maximum Marks: 70M

SECTION-A

Answer all the following questions.

1. Enumerate the storage classes in C language and give example for each.

2. Briefly explain the function calling mechanisms.

3. Mention the similarities and differences between arrays and linked lists.

4. Explain fseek and ftell functions for file handling in C.

5. Mention the disadvantages of linear search algorithm.

Answer FIVE questions choosing at least one from each unit   (5Q×10M =50M)

UNIT-I

6. Write an algorithm for finding maximum and minimum in numbers of a given sa. Draw a flow

7. e) Write a C program lu Illustrito hit\vlso operations.
   b) Write a C program for accesing nmund mbnlp Tuning elomonfu uf' ur arruy.

UNIT-II

8. a) What are the C string functions eglobie in C? Oivc example for onvh.
   ; Wrlieo C program to even strlng og strlng functlo9s.

(OR)

9. Illustrate with C programs the methods For pursing arrays and pointers lafLn;ctlon .

UNIT-III

10. a) Write a C problem Io wrlie the flbonaecl series of numbers uaing reéurslon.
    b) explain.1< concept.,and Iaport«ne• of rocurelon .In C lunguugo.

(OR)

11. Explain the allotcaion.<ind Plug up of mtmory. Fow ,to allocate memory For,arraye of dllTorent data typu7

UNIT-IV

12. Exglsln tfie,commonly used **/reprooeñsor.** command? and gIve'exirhpIe.for.âa*h,

(OR)

13. girl» the procedure for writing and reading structures using bhary fllee.

UNIT-V

14. Write s C.progrim-for bubble sort method for sorllrig numbers. Give an example.

(OR)

15. tllustmte the.order Ie mplerIty.of8eIeotlon cart algorithm through example.

SRJINDU co EGE OFENGINEERING & TECHNOLOG

(An Autonomous Insutuuoo under UGC, New Dclbi)(Reoognized under 2(1)JlJld 2(B) of UGC Act 1956

| B. **Tech** | Semester - **End Examinations (Regular/Suppl.) Dec/Jan-2019-20**
R18CSE1101- PROGRAMMJNG FOR PROBLEM SOLVING
(Common to Civil,Mecb & ECE)

BR-18   Write Your Ht.No.

I B .Tccb   II Semester ——(SUPPL.)—— End **Examinations** July - 2021
PROGRMIMING FOR PROBLEM SOLVING
14 /07/2021   (Common to EEE, CSE and IT)   Day- 3 (A.
Duration: 3 Hrs   Maximum **Mark,:** 70M

SECTION-A

Answer all the following questions.   **(SQ.1 4M** = 20M)

I.   What is an identifier? Classify following as valld/lnvalld identifier. num I, SnwnI, +add, a 2, for, lst_J>aper_mark.s.

2.   Define Structure and represent how to initialize a Structure?

3.   Recall command line argument.

4.   Infer about random filehandling functions.

5.   Enlist thetypes of sorting available in C.

SECTION-B   ("''\

Answer FIVE questions choosing at least one from e ch   (SQ.llOM =SOM)

UNIT-I

6.   a) Illustrate an algorithm and flowchart.
     b) Write C program to find the sum of number fm a.
                    (OR)

7.   Enumerate various branching statements in C   es.

8. Summarize any 4 string library fun tio and example.

9.   Write a C program to illustrate cal   -v e   arameter passing technique.
                    T-ill

_,,,| Make use of recursive function and write a C program for finding factorial ofan umb.er
                    (OR)

11. Elaborate Pointer concept an W the pointer variable declared and Initialized with example.

                    T-IV

12. Describe fme cessor directives m(R)

13. a) Write th   or opening file wi   various modes and closing file.
     b) Infer the   g file handling funcoons:

     i) fseekO
     ii) ftellO
     iii) rewindO
                    UNIT-V

14. List **and** exemplify the different ways for searching elements in an array.

                    (OR)

IS. :ns:: = tJ p aC program that reads N integer numbers and arrange them in
     IICending order using selection Sort

SRJINDU co EGE OFENGINEERING & TECHNOLOG

(An Autonomous Insutuuoo under UGC, New Dclbi)(Reoognized under 2(1)IlJld 2(B) of UGC Act 1956)

| B. Tech | Semester - End Examinations (Regular/Suppl.) Dec/Jan-2019-20
R18CSE1101- PROGRAMMJNG FOR PROBLEM SOLVING
(Common to Civil,Mecb & ECE)

Duratlop: 3Hn

Maximum **Mark. :** '

(5Qxl4M =70M)

Answ ,. an}' FIVE questions from thefollo•1dng.

I. a) Uefinc identifier.
   b) List the rul to construct identifier.
   c) Classify the following as valid/invalid Identi fier..:
      i) num2
      ii) Snuml
      iii) +add
      iv) a_2
      v) 199_space.

2. **fflullrate**lWi1ch **statement and** Write a P gram to perform arithmetic operations using switch.

3. Write **a** C program that defines a struct e employee con ntaining the details :such ns empno, **empname,** department name and salary e structure re has to store 20 emplO)ees in an o rganization. Use the appropriate **to** me the above detailsand define a function that will display the contents. "\.

4. a) List out the advantages *Of* 'll.
   b) Write **a** C program to **rial** number using function.

   J) Discuss the concept f y: fpointcrswith examples.
   b) Write **a** C p m **t6** read and display multiplestrings using **pointers.**

6: Enume any preprocessor d1 rect 1vcs w , th definition.

7. Write a C program to search an clement u.c;ing linear and **binary techniques.**

I. **a)** Write an algorithm 10 find th area 0á circle. l4M)

   b) Paraphrase cuJl-by value and call-by reference. (0f) -Z.,,

   c) **Define** Pointer anJ repre54,.--nt how 10 declare pointer? l3,\f)

   d) List out saandard IJO Predefined sucams in Stio.. h (3.W)

• • • • •

MID-I QUESTION PAPER

Duration: 90Mins   Date: 30.11.2018 FN   Max Marks:

Section – A

Answer _All_ the questions   Marks: 5Qx1M

1. Define self-referential structures.
2. Define file. Explain types of files.
3. Define Macro.
4. Define Searching.
5. Differentiate time and space complexity.

Section – B

Answer any _FOUR_ questions   Marks: 4Qx5M =

6. Write a 'C'program to print the numbers in Fibonacci series.
7. Briefly explain about the following with an example
    a) malloc()   b) calloc()   c) realloc()   d) free()
8. Write a 'C'program to display contents of file on the screen.
9. Explain all preprocessor commands with example.
10. Explain linear search technique.
11. Write a C program on Insertion sort.

***

MID-II QUESTION PAPER

Section – A

Answer _All_ the questions   Marks: 5Qx1M = 5M

1. Define Algorithm and Flowchart.
2. What are bitwise operators? Give example for each.
3. Explain difference between structure and union.
4. Define a function.
5. Define recursion.

Section – B

Answer any _FOUR_ questions   Marks: 4Qx5M = 20M

6. Write an Algorithm to print biggest of three numbers.
7. Explain different loops available in C with example.
8. Explain Conditional Branching statements with example.
9. Write a 'C' program to concatenate two strings.
10. Explain parameters and return types of a function.
11. Explain about Enumeration data type.

***

ENGINEERING GRAPHICS

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)

B.Tech. - I **Year-I Semester**

L	T	P	C
1	0	4	3

(R20MED1102) ENGINEERING GRAPHICS

Course objectives:
 a) To provide basic concepts in engineering drawing.
 b) To impart knowledge about standard principles of orthographic projection of objects.
 c) To draw sectional views and pictorial views of solids.

Course Outcomes: At the end of the course, the student will be able to:
 a) Preparing working drawings to communicate the ideas and information.
 b) Read, understand and interpret engineering drawings.

UNIT - I
Introduction to Engineering Drawing: Principles of Engineering Graphics and their Significance, *Conic* Sections including the Rectangula r Hyperbola - General method only. Cycloid, Epicycloid and Hypocycloid, Scales - Plain & Diagonal.

UNIT- II
Orthographic Projections: Principles of Orthographic Projections - Conventions - Projections of Points and Lines, Projections of Plane regular geometric figures.- Auxilia ry Planes.

UNIT-III
Projections of Regular Solids - Auxiliary Views - Sections or Sectional views of Right Regular Solids - Prism, Cylinder, Pyramid, Cone - Auxiliary view s - Sections of Sphere

UNIT-IV
Develop ment of Surfaces of Right Regular Solids - Prism, Cylinder, Pyramid and Cone, Intersection of Solids: Intersection of - Prism vs Prism- Cylinder Vs Cylinder

UNIT - V
Isometric Projections: Principle s of Isometric Projection - Isometric Scale - Isometric Views - Conventions - Isometric Views of Lines, Plane Figures, Simple and Compound Solids - Isometric Projection of objects havi ng non- iso metric lines. Isometric Projection of Spherical Parts. Conversion ofIsometric Views to O1thographic Views and Vice-versa - Con ventions.
Introduction to the perspective views, their types & Perspective views of simple objects

Introduction to CAD:
Introduction to AUTOCAD Software Package Commands.- Creation of 2D Sketches by CAD Package

TEXTBOOKS:
 a) Engineering Drawing N.D. Bhatt/ Charotar
 b) Engineering Drawing / N. S. Parthasarathy and Vela Murali/ Oxford

REFERENCE BOOKS:
 1. Engineering Drawing / Basant Agrawal and McAgrawal/ McGraw Hill
 2. Engineering Drawing/ M. B. Shah, B.C. Rane/ Pearson.
 3. Computer Aided Engineering Drawing - K Balaveera Reddy et al - CBS Publishers

Sub. Code & Title	ENGINEERING GRAPHICS (R20MED1102)	
Academic Year: 2021-22	Year/Sem./Section	I-I
Faculty Name & Designation	K.VIJAY KUMAR /VINEETH/L.RAVI	

UNIT – I
INTRODUCTION TO ENGINEERING DRAWING

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO
1.1	Introduction to Engineering Drawing	T1	1	36	Black board	03		CO1
1.2	Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering	T1	37	47	Black board	03		CO1
1.3	Geometrical constructions	T1	69	89	Black board	03		CO1
1.4	Introduction of scales , Construction of plain scales	T1	51	54	Black board	03		CO1
1.5	Construction of Diagonal scales	T1	55	59	Black board	03		CO1
1.6	Introduction to Conic section. General Method For Ellipse, parabola & Hyperbola	T1	101	113	PPT, Black board	03		CO1
1.7	Construction methods of ELLIPSE	T1	104	109	Black board	03		CO1
1.8	Construction methods of PARABOLA	T1	110	112	Black board	03		CO1
1.9	Construction methods of HYPERBOLA,RECTANGULAR HYPERBOLA	T1	113	114	Black board	03		CO1
1.10	Introduction to Cycloidal Curves. Construction of Cycloid, Epi-cycloid and Hypocycloid	T1	116	121	PPT, Black board	03		CO1
1.11	Additional Exercises	T1			PPT, Black board	03		CO1
	Review	Signature of the HOD/Coordinator						

Sub. Code & Title	ENGINEERING GRAPHICS (R20MED1102)	
Academic Year: 2021-22	Year/Sem./Section	I-I
Faculty Name & Designation	K.VIJAY KUMAR /VINEETH/L.RAVI	

UNIT – II

ORTHOGRAPHIC PROJECTIONS

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO
2.1	Introduction of Orthographic Projection and their Conventions	T1	169	176	PPT, Black board	03		CO2
2.2	Projections of Points	T1	189	194	PPT, Black board	03		CO2
2.3	Introduction to Projections of Lines, Problems based on True lengths and traces.	T1	195	240	PPT, Black board	03		CO2
2.4	Introduction to Projections Of Planes and problems	T1	255	270	PPT, Black board	03		CO2
2.5	Introduction to Auxiliary plane Methods and Problems	T1	241	254	Black board	03		CO2
	Additional Exercise	T1			PPT, Black board	03		CO2
	Review	Signature of the HOD/Coordinator						

Sub. Code & Title	ENGINEERING GRAPHICS (R20MED1102)		
Academic Year: 2021-22		Year/Sem./Section	I-I
Faculty Name & Designation		K.VIJAY KUMAR /VINEETH/L.RAVI	

UNIT-III

PROJECTION OF RIGHT REGULAR SOLIDS

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO
3.1	Introduction to projection of solids. Projection of Solids in simple positions	T1	271	279	PPT, Black board	03		CO3
3.2	Projection of Solids Axis inclined to one plane and parallel to other plane	T1	279	283	Black board	03		CO3
3.3	Projection of Solids with Axis inclined to both the planes	T1	286	293	Black board	03		CO3
3.4	Auxiliary plane method for solids ,Additional Exercise	T1	294	299	Black board	03		CO3
3.5	Introduction to section of solids,Problems on Section of Prism & Pyramid	T1	313	325	PPT, Black board	03		CO4
3.6	Problems on Section of Cylinder & Cone	T1	326	336	Black board	03		CO4
3.7	Additional Exercise	T1			PPT, Black board	03		CO4
	Review		Signature of the HOD/Coordinator					

UNIT-IV

DEVELOPMENT OF RIGHT REGULAR SOLIDS

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO
4.1	Introduction to Development of Surfaces and problems on Development of Right Regular Solids – Cube,Prisms & cylinder	T1	351	359	PPT, Black board	03		CO5

4.2	Problems on Development of Right Regular Solids – Pyramid & cone	T1	360	369	Presentation	03		CO5
4.3	Additional Exercise	T1			Black board	03		CO5
4.4	Introduction to Interpenetration of solids Problems on Prism Vs Prism	T1	381	385	PPT, Black board	03		CO5
4.5	Problems on Cylinder Vs Cylinder	T1	390	394	Black board	03		CO5
4.7	Additional Exercise	T1			Black board	03		CO5
	Review	**Signature of the HOD/Coordinator**						

UNIT-V

ISOMETRIC PROJECTION

Unit/ Item No.	**Topic (s)**	Book Reference	Page (s) From	To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO
5.1	Principles of Isometric projection, scale, Isometric Views and Conventions	T1	417	420	PPT, Black board	03		CO6
5.2	Isometric view of planes & simple solids,	T1	421	426	Black board	03		CO6
5.3	Isometric view of compound solids & Non IsometricLines	T1	427	433	Black board	03		CO6
5.4	Conversion of Orthographic to Isometric View	T1	434	464	Black board	03		CO6
5.5	Conversion of Isometric to Orthographic View	T1	526	538	Black board	03		CO6
5.6	Additional Exercise							
5.7	Introduction to Perspective Projection, Problems on perspective view of Lines,	T1	477	483	PPT, Black board	03		CO6
5.8	Problems on perspective view of planes and simple solids	T1	484	498	Black board	03		CO6
5.9	Introduction to Auto-CAD Software package commands.Creation of 2-D sketches	T1	621	639	PPT, Black board	03		CO6
5.10	Additional Exercise	T1			PPT, Black board	03		CO6
	Review	**Signature of the HOD/Coordinator**						

LIST OF TEXT BOOKS AND REFERENCES

Text Books:

T1.Engineering Drawing N.D. Bhatt / Charotar

T2. Engineering Drawing / N. S. Parthasarathy and Vela Murali/ Oxford

Reference Books:

R1.   Engineering Drawing / Basant Agrawal and McAgrawal/ McGraw Hill
R2.   Engineering Drawing/ M. B. Shah, B.C. Rane / Pearson.
R3.   Computer Aided Engineering Drawing – K Balaveera Reddy et al – CBS   Publishers

Weblinks

1.   https://www.slideshare.net/GovindPatil9/engineering-drawing-basicsppt

2.https://nptel.ac.in/courses/112103019/3

3.https://www.slideshare.net/nyioq/orthographic-projection

4.   https://www.slideshare.net/AniketSuryawanshi/projection-of-solids-73140319

5.   www.iitg.ac.in/kpmech/ME111-2016/Development.ppt

6.   https://www.slideshare.net/kashyapshah11/development-of-surfaces-of-solids

7.   www.iitg.ac.in/kpmech/ME111-2016/Intersection%20of%20soildsR1.ppt

8.   https://www.slideshare.net/vijendrarathor849/isometric-projection-73581702

9.   https://www.slideshare.net/eglive/lesson-13perspectiveprojection

	SRI INDU COLLEGE OF ENGG & TECH QUESTION BANK (Regulation :R20) Department of ECE		(Regulation :R20) Prepared on Rev1: Page: 8 of 24
Sub. Code & Title	**ENGINEERING GRAPHICS (R20MED1102)**		
Academic Year: 2021-22		**Year/Sem.**	**I-I**
Faculty Name & Designation		**K.VIJAY KUMAR /VINEETH/L.RAVI**	

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)
(1.Remembering 2. Understanding 3. Applying 4. Analyzing 5. Evaluating 6. Creating)

UNIT-1		
1MARKS QUESTIONS	**BT Level**	**Course Outcome**
1. Define conic section? When do we get the ellipse and parabola from the cone?**(R-18 December 2018)**	1	CO1
2. What is the difference between plain scale and diagonal scale? **(R-18 December 2018)**	4	CO1
3. Define cycloid, epicycloids and hypocycloid? ?**(R-18 December 2018)**	1	CO1
4.. Draw a regular pentagon of 50mm side using General method?**(R-18 May 2019)**	6	CO1
5. Construct a scale of 4cm=1decimeter to read up to 1 m and mark on it a length of 0.58m.**(R-18 May2019)**	6	CO1
6. Draw a regular hexagon of 40mm side using general method.**(R-18 June 2019)**	6	CO1
7. What are the types of cycloids? Give real time applications for each one of them.**(R-16 Dec2017/Jan2018)**	2	CO1
8 What are different types of scales? Explain **(R-20 July 2021)**	2	CO1
9 Construct a scale of 1.5 inches=1 foot to show inches and long enough to measure up to 4 feet.**(R-16 October 2020)**	6	CO1
10 What are the two major methods of dimensioning, explain?**(R-16 October 2020)**	2	CO1
5 MARKS QUESTIONS		
1. Draw an ellipse when the distance of its focus from its directrix is 50mm and eccentricity is 2/3.Also draw a tangent and a normal to the ellipse at a point 70mm away from the directrix**.(R-18 December 2018)**	3	CO1
2. Draw an epi-cycloid of circle of 40 diameter, which rolls on another circle of 120 diameter for one revolution clockwise. Draw a tangent and a normal to it at a point 90 from the centre of the directing circle.**(R-16 October 2018)**	3	CO1
3. The distance between Delhi and Agra is 200km.In a railway map it is represented by a line 5cm long. Find its R.F. Draw a diagonal scale to show single km. and maximum 600km.Indicate on the following distance i) 222km ii) 336km iii) 459km iv) 569km. **(R-16 October 2020)**	3	CO1
1. Draw a parabola having conjugate axes of 50mm and 30mm long and inclined at 75º to each other.**(R-18 December 2018)**	3	CO1
2. Draw an ellipse having the major axis of 60mm and minor axis of 40mm. **(R-18 December 2018)**	3	CO1
3. A coin of 40mm diameter rolls over a horizontal table without slipping. A point on the circumference of the coin is in contact with the table surface in the beginning and after one complete revolution. Draw the path traced by the point. Also draw a tangent and normal at any point on the curve. **(R-18 December 2018)**	6	CO1

4.	Construct a diagonal scale of RF=3:200 showing meters, decimeters, and centimeters. The scale should measure upto 6meters.Show a distances of 4.56meters. **(R-18 December 2018)**	6	CO1
8	Construct a rectangular hyperbola when a point P on it is at a distance of 30mm and 40mm respectively from the two asymptotes.**(R-18 May 2019)**	6	CO1
9	To draw a hyperbola with the distance of the focus from the directrix at 50mm and e=3/2 by eccentricity method.**(R-18 June 2019)**	6	CO1
10	Draw, a hypo-cycloid of a circle of 40 diameter which rolls inside another circle of 160 diameter, for one revolution counter clock –wise. Draw a tangent and normal to it at a point 60 from the centre of the directing circle.**(R-16 Dec02018/Jan 2019)**	6	CO1
	Unit -II		
	1 MARKS QUESTIONS		
1.	Differentiate between first Angle and third Angle projection systems? **(R-18 May 2019)**	4	CO2
2.	Why the projections of an object are not drawn in 2nd and 4th quadrants"**? (R-18 December 2018)**	1	CO2
3.	What is trace of a Plane? **(R-18 December 2018)**	1	CO2
4.	What is projection, projector and plane of projection? **(R-18 December 2018)**	1	CO2
5.	What are the features of first angle projection? **(R-18 May 2019)**	1	CO2
6.	Show the symbol of first angle and third angle projections? **(R-16 Dec2017/Jan 2018)**	3	CO2
7.	How the projection of an object is obtained? Explain? **(R-16 Dec2017/Jan 2018)**	2	CO2
8	Draw the symbolic representation of the third angle projection? **(R-16 Dec2017/Jan 2018)**	4	CO2
9	What is orthographic Projection? **(R-18 December 2018)**	1	CO2
10	Draw the projection of the following points on the same ground line, keeping the distance between projectors equal to 25mm • Point A,20mm above H.P,25mm behind the V.P • Point B,25mm below H.P,20mm behind the V.P **(R-18 May 2019)**	4	CO2
	5 MARKS QUESTIONS		
1 A	line AB, 65mm long, has its end A 20mm above the H.P and 25mm in front of the V.P. The end B is 40mm above the H.P and 65mm in front of the V.P. Draw the projection of line AB and shows its inclination with the H.P and V.P**.(R-18 Dec 2018)**	6	CO2
2.	A line AB, 90mm long, is inclined at 45□ to the H.P and its top view makes an angle of 60□ with the V.P. The end A is in the H.P and 12mm in front of the V.P Draw its front view and Find its True inclination with the V.P.**(R-18 Dec 2018)**	3	CO2
3.	A line AB, 75mm long, is inclined at 45□ to the H.P. and 30□ to the V.P. its end B is in the H.P. and 40mm in front of the V.P. Draw its projections.**(R-18 Dec 2018)**	6	CO2
4.	A line PQ, 90mm long, is parallel to H.P & makes an angle of 30□ with the V.P. its end P is 25mm in front of the V.P. Draw its Projections.**(R-18 May 2019)**	3	CO2
5.	A line AB, 90mm long, is inclined at 45□ to the H.P and its top view makes an angle of 60□ with the V.P. The end A is in the H.P and 12mm in front of the V.P Draw its front view and Find its True inclination with the V.P.**(R-18 June 2019)**	6	CO2
6.	A square ABCD of 50mm side has its corner A in the H.P., its diagonal AC inclined at 30□ to the H.P. and the Diagonal BD inclined at 45□ to the V.P. and parallel to the H.P. draw itsProjections.**(R-18 Dec-2018)**	3	CO2
7.	A regular hexagonal plane of side 30 has a corner at 20 from V.P and 50 from H.P. Its surface id inclined at 45° to the V.P and perpendicular to H.P. Draw the projections of plane. **(R-18 Dec-2018)**	6	CO2
8	Draw the projection of a circle of 50mm diameter resting in the H.P. on a point A on the circumference, its plane inclined at 45□ to the H.P. The diameter AB making 30□ angle withthe V.P.**(R-16 Dec 2018/Jan 2019)**	3	CO2

9	A pentagonal plane ABCDE of 30mm side has its plane inclined at 45º to H.P. Its diameter joining the vertex B to the mid point F of the base DE is inclined at 20º to the XY line. Draw its projections keep the corner B near to V.P. **(R-18 May 2019)**	6	CO2
10	A rectangular plane of 30mm and 50mm sides is resting on H.P and one small side is 30^0 inclined to V.P. The surface of the plane is inclined at 45^0 to the H.P. Draw the projections of plane.**(R-16 Dec2017/Jan 2018)**	3	CO2

Unit – III			
1 MARKS QUESTIONS			
1.	Draw any two polyhedra and solid revolution figures **(R20 July- 2021)**	**2**	CO3
2.	What are the different methods of solids generation? Explain **(R20 July- 2021)**	**1**	CO3
3	Draw the projection of cylinder of base 40 diameter and axis is 60 long ,when it is resting on H.P. on one of its base **(R20 July-2021)**	**1**	CO3
4.	A cube of 35 mm long edges is resting on H.P. on one of its faces with vertical face inclined at 30^0 to the V.P. It is cut by a section plane parallel to the V.P. and 9 mm away from the axia and further away from the V.P. Draw its sectional front view and top view. **(R20 July-2021)**	**1**	CO3
5	A cube of 50 mm long edges is resting on H.P. with its vertical faces equally inclined to the V.P. Draw its projections.**(R16 October-2020)**	**1**	CO3
6.	What are different types of solids? **(R18 December-2018)**	**1**	CO3
7	What is the difference between prism and pyramid? **(R18 December-2018)**	**1**	CO3
8.	Draw the projection of cone of base 40 diameter and axis is 60 long ,when it is resting on H.P. on one of its base **(R20 Sept-2021)**	**1**	CO3
9.	What is the difference between Dodecahedraon and Icosahedron? **(R20 Sept-2021)**	**1**	CO3
10.	Draw any three of solid of revolution diagrams. **(R18 May-2019)**	**1**	CO3
5 MARK QUESTIONS			
1.	A square pyramid with side of base of 25mm and axis 60mm is resting with its base on H.P. Draw the projections of the pyramid when one of its base edges is parallel to V.P. The axis of the pyramid is 25 mm in front of V.P.**(R20 Sept-2021)**	**6**	CO3
2	Draw the projections of a pentagonal pyramid of side of base 25 mm when its apex is on the V.P., its axis parallel to H.P. and one of the sides of the base parallel to H.P. **(R20 Sept-2021)**	**6**	CO3
3.	A triangular prism of base 40 side and axis 60 long, is resting on H.P on one of its bases, with a face Perpendicular to V.P. Draw the projections of the solid.**(R20 July-2021)**	**6**	CO3
4	A pentagonal pyramid of with side of base 25 and axis 70 long, has an edge of the base on H.P.and inclined at 45° to V.P. The triangular face containing that edge make an angle of 30° with H.P. Draw the projections of the solid. **(R20 July-2021)**	**6**	CO3
5.	A hexagonal pyramid base 25 mm side and axis 55 mm long has one of its slant edges on the ground. A plane containing that edge and the axis is perpendicular to the H.P and inclined at 45^0 to the V.P. Draw its projections when the apex is nearer the V.P than the base. **(R20 July-2021)**	**6**	CO3
6	A square prism of 30 mm base edges and 60 mm long is resting on a longer edge on the ground. Its axis is 450 to the VP. A section plane parallel to HP cuts the object. It is 30 mm from the longer edge which is on the ground. Draw the sectional view from the above. **(R20 July-2021)**	**6**	CO3
7.	Draw the projections of a hexagonal prism of base 30 side and axis of 70 long, when it is resting on one of its corners of the base on H.P. Consider the axis of the solid is inclined at 45° to H.P. **(R20 July-2021)**	**6**	CO3
8.	Draw the projections of a cylinder of diameter 50 and 90 long that has its axis inclined at 45° to V.P. and 30° to H.P. **(R20 July-2021)**	**6**	CO3

9.	A pentagonal pyramid of base 30mm side and axis 60mm long has its apex in V.P. and the axis perpendicular to V.P., a corner of the base is resting on the ground and the side of the base contained by the corner is inclined at 30□ to the ground. Draw its projections. **(R20 Sept-2021)**	**6**	CO3
10.	A cylinder of base diameter 50mm and axis 65mm rests on a point of its base circle on the H.P. Draw its projections when the axis is inclined at 30^0 to the H.P. and top view of the axis is perpendicular to the V.P. **(R18 December-2018)**	**6**	CO3

| **Unit-IV**			
1 MARKS QUESTIONS			
1.	Define development of surfaces and give its engineering applications? **(R20 July-2021)**	1	CO4
2.	Give the classification of Surfaces in development of surfaces. **(R20 July-2021)**	2	CO4
3.	What is use of development of surfaces and give its uses? **(R20 July-2021)**	3	CO4
4.	What is the need of development of surfaces? Classify the methods of development. **(R18 May-2019)**	1,2	CO4
5.	Write the steps for development of a cylinder. **(R18 May-2019)**	1	CO4
6.	Draw the development of cone of diameter 50 mm and height 30 mm. **(R14 Dec-2018/Jan-2019)**	2	CO4
7.	Sketch the development of a cube of base edge of 25 mm.**(R20 Sept-2021)**	2	CO4
8	Brief description of interpenetration of solids with its application. **(R16 December-2018)**	1	CO4
9	Draw the development of surface of a cube of side 40 mm.**(R18 Dec/Jan-2019-20)**	2	CO4
10	Explain the methods of development of surfaces. **(R18 May-2019)**	2	CO4
5 MARK QUESTIONS			
1.	A cylinder of diameter of base 35 mm and height of 60 mm is standing on its base on H.P. A cutting plane inclined at 45° to the axis of the cylinder passes through the left extreme point of the top base. Develop the lateral surface of the truncated cylinder. .**(R20 Sept-2021)**	6	CO4
2.	A right circular cylinder of 60 mm diameter and a height of 90mm resting on its base in HP. It is completely penetrated by another cylinder of 45 mm diameter and 90mm long such that their axis bisect each other at right angels and are parallel to VP. Draw their projection showing curves of intersections. **(R20 Sept-2021)**	6	CO4
3.	An oblique cone of base 50 diameter and axis 70 long, is resting on its base on H.P. The axis is inclined at 30° to the base. Draw the development of the cone. **(R20 July-2021)**	6	CO4
4.	A vertical cylinder of 50 diameter, is penetrated by another cylinder of 35 diameter. The axes of the two cylinders are intersecting at right angle. Draw the projections of the two cylinders showing the curves of intersection. **(R20 July-2021)**	6	CO4
5.	A hexagonal prism, edge of base 20 mm and axis 50 mm long, rests with its base on H.P such that one of its rectangular faces is parallel to V.P. It is cut by a plane perpendicular to V.P, inclined at45^0 to H.P and passing through the right corner of the top face of the prism develop the lateral surface of the truncated prism. **(R20 July-2021)**	6	CO4
6.	A vertical square prism, base 50 mm side and height 90 mm has a face inclined at 30° to the V.P. It is completely penetrated by another square prism, base 38 mm side and axis 70 mm long, faces of which are equally inclined to the V.P. The axes of the two prisms are parallel to the V.P. and bisect each other at right angles. Draw the projections showing lines of intersection. **(R20 July-2021)**	6	CO4
7.	A cube of 40 edge, is resting on a face on H.P, such that a vertical face is inclined at 30° to V.P. It is cut by a section plane perpendicular to V.P and inclined to H.P. at 45° and passing through a point at 10 from the top end of the axis. Develop the lateral surface of the lower portion of the cube. **(R20 July-2021)**	6	CO4
8	A vertical square prism of base 40 side, is penetrated by a horizontal square prism of 30 base side such that, the axes are 5 apart. The axis of the horizontal prism is parallel to V.P. and the faces of both the prisms are equally inclined to V.P. Draw the projections of the two prisms, showing the lines of intersection. **(R20 July-2021)**	6	CO4

9	A hexagonal prism of side of base 25 mm and axis 60 mm long is resting on its base on H.P. such that a rectangular face is parallel to V.P. It is cut by a section plane perpendicular to V.P. and inclined at 30° to H.P. The section plane is passing through the top end of an extreme lateral edge of the prism. Draw the development of the lateral surface of the cut prism. **(R20 Sept-2021)**	6	CO4
10	A Cylinder of 50 mm diameter and axis 70 mm is completely penetrated by a square prism of 25 mm sides and 70 mm axis horizontally. Both axes intersect and bisect each other. All faces of prism are equally inclined to H.P. Draw projections showing curves of intersections. **(R18 December-2018)**	6	CO4

Unit-V		
1 MARKS QUESTIONS		

1.	Define the terms: i) Isometric view ii) Isometric scale iii) Isometric axis. **(R18 December-2018)**	1	CO5
2.	Define the terms: i) Isometric projection ii) Orthographic projection iii) Perspective view. **(R18 December-2018)**	1	CO5
3.	What are the difference between oblique projection and Isometric projection. **(R18 May-2019)**	1	CO5
4.	Explain the Coordinate system used in AutoCAD. **(R18 May-2019)**	2	CO5
5.	What are the principles of Isometric projection and Isometric Scales. **(R18 June-2019)**	2	CO5
6.	Draw the isometric view of a pentagonal plane of 30mm side when one of its sides is parallel to H.P, (a) When it is horizontal and (b) vertical. **(R18 Dec/Jan-2019-20)**	3	CO5
7.	How do you set the limits in AutoCAD drawings? **(R18 May-2019)**	2	CO5
8	What do you understand by World Coordinate System (WCS) and User Coordinate System? **(R18 July-2021)**	2	CO5
9	Write the difference between Isometric and Orthographic projection. **(R20 July-2021)**	2	CO5
10	Draw the isometric view of a cube of 20 mm base. **(R20 July-2021)**	3	CO5

5 MARK QUESTIONS		
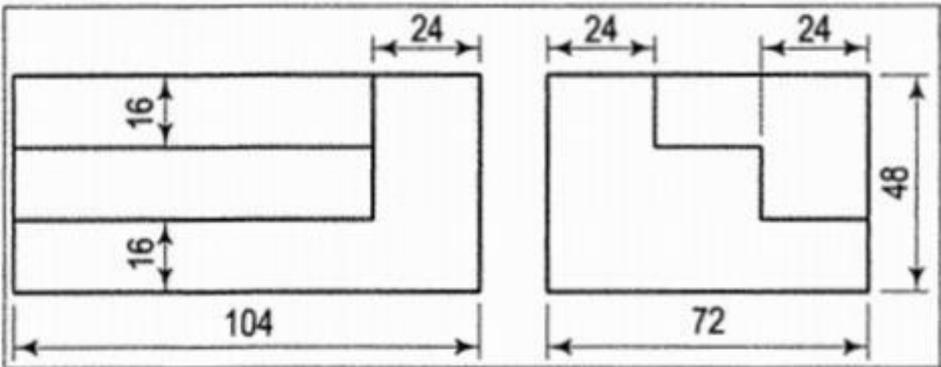
1.	Draw the Isometric view for the following figure. **(R18 Sept-2020)**	6	CO5

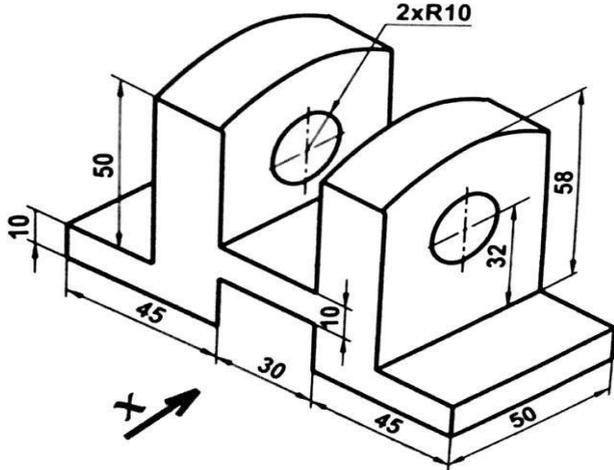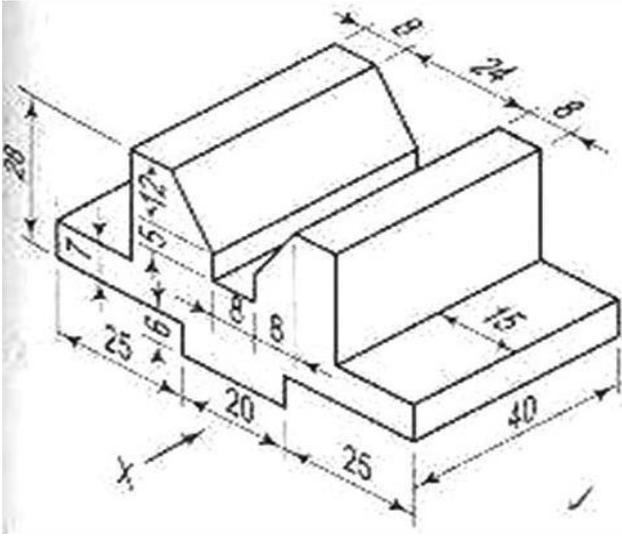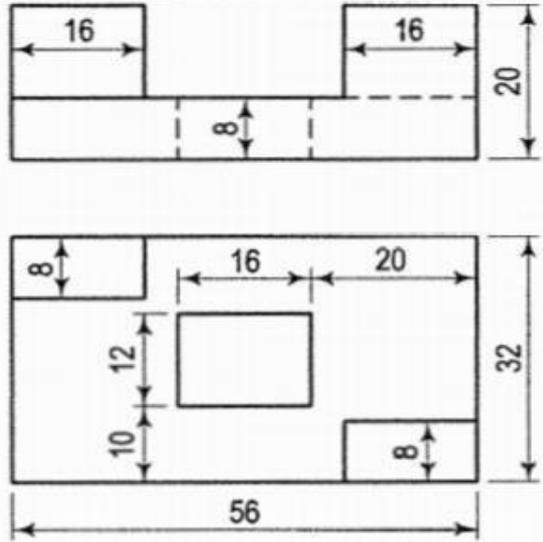| 2.	Draw the front view. Top view and right side view for the following figure. **(R20 July-2021)**	6	CO5
3.	Draw the isometric drawing of a cone of base diameter 40 and axis 70 long. **(R20 July-2021)**	6	CO5
4	Draw the standard three views of the following figure. **(R20 July-2021)**	6	CO5
5.	Draw the front view, top view and the side view for the Object shown below. **(R20 July-2021)**	6	CO5
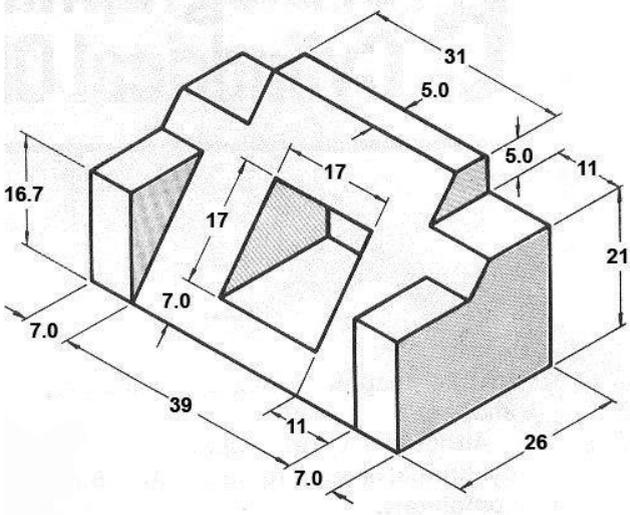
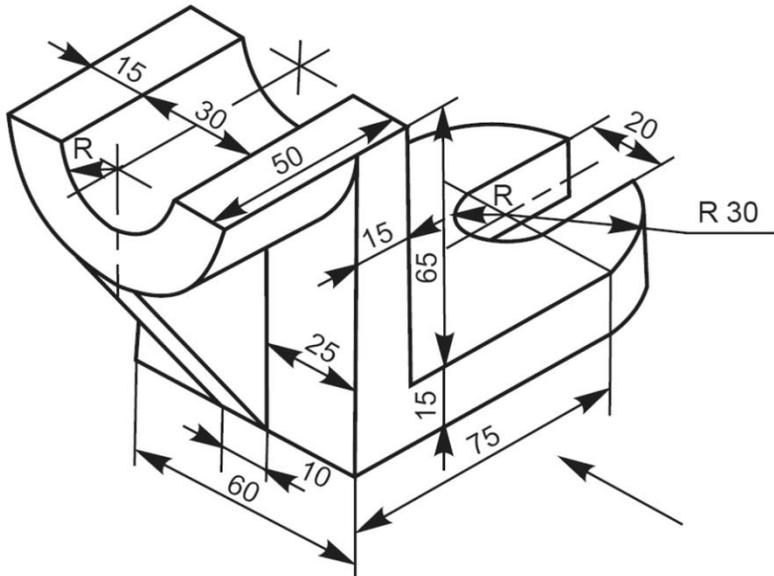| 6.	Draw the Isometric view for the following figure. **(R18 Sept-2020)**	6	CO5
7.	A hexagonal prism with side of base 30 and axis 60 long, rests centrally on one of its rectangular faces, on a cylindrical block of 70 diameter and 20 thick. The cylindrical block rests on its base on H.P. and the axis of the prism is perpendicular to V.P. Draw the isometric view of the combination of the two solids. **(R20 July-2021)**	6	CO5
8	Draw the standard three views of the following figure. **(R20 July-2021)**	6	CO5
9	Draw the Front and Top views for the following figure: **(R20 Sept-2021)**	6	CO5
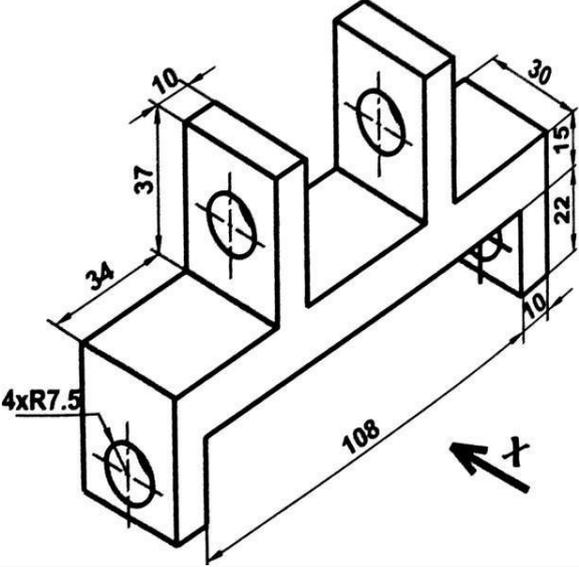
| 10 | A sphere of 60 mm diameter is placed centrally on the top of a frustum of a square pyramid. The base of the frustum is 60 mm, top is 40 mm, and height 50 mm. Draw thw isometric projection of the arrangement. **(R18 December-2018)** | 6 | CO5 |

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I B.Tech I Semester   (REGULAR)   End Examinations July • 2021

ENGINEERING GRAPIDCS

15/07/2021   (Electronics nnd Communicntion Engineering)   Day- 4 (FN)

Duration: 3 Hrs   Maximum Marks: 70M

SECTION-A

Answer all tlzefollowing questions.   (5Qx 4M = 20M)

I.   What are different types of scales? Explain.

2.   Write the difference between First angle and Third angle projection.

3.   Draw any two Polyhedra and solid revolution figures.

4.   Explain different methods to draw development of surfaces.   ,i

5.   Write the difference between Isometric and Orthographic projection.

SECTION-B

Answer FIVE questions choosing at least one from each ,.._.____   (5Qx10M =*SOM*)

UNIT-I

6.   Construct a Diagonal scale of lcm=2.5km,

7.   Draw a involute of square 30mm sides. Draw_   a **entt** it from any poim@:curvf *J*

8.   A line AB 85mm long has its end A 25   abov HP   and 20mm in front of VP. The end Bis 60mm above HP and 50mm in front   . ra   e projections and find its inclinations withHP

andVP.   **R)**

9.   Draw the projections of circle o   mm iameter when its plane is equally inclined to HP and VP. One end of the diameter **tou**   and other end touches VP.

UNIT-ID

10. A cone 50mm base and axis 60mm long touches the VP on a front of its base circle. The base is inclined 30° to VP and the front view of the axis is inclined at 45° to HP. Draw its projections.

(OR)

11. A square i   **Yb1s'e** 35mm and axis length 60mm is resting on HP on one of its triangular faces with ax   ar llel to VP. It is cut by a plane inclined at 45° to VP and perpendicular to HP and is bisecting   e top view of the axis. Draw its top view, sectional front view and true shape of section.

UNIT-IV

12. Draw the development of lower portion of cylinder, diameter 50mm and axis 75mm ,when it is cut by a plane perpendicular to VP, inclined at 45° to HP and passing through mid-point of axis.

(OR)

13. A pentagonal pyramid of base side 30mm and axis length 60mm resting on HP on its base with a side of base is perpendicular to VP. It is cut by a plane perpendicular to VP and parallel to HP and meets axis at a distance 25mm from the vertex. Draw the development ofremaining portion of pyramid.

P.T.O.

14. Draw the front view, top and nny side view of figure. I given in first angle projection, All dimensions in mm.

15. Draw the Isometric view of the fi,,,,,,, imensions in mm.

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I B.Tech I Semester (REGULAR)   End Examinations July - 2021
ENGINEERING GRAPHICS

15/07/2021   (Electronics and Communication Engineering)   Day• 4 (AN)

<u>Duration: 3 Hrs</u>   Maximum Marks: 70M

SECTION-A

Answer all the following questions.   (5Qx 4M = 20M)

1. Trace the following statement inhigher case lettering by taking the height ofletters is equal to 18mm.
   "Good Drawing is spoiled by bad lettering".
2. Define conic section. When do we get triangle from conic section?
3. What are the different methods of solids generation? Explain.
4. What is the use of development of surface? How do we get shape on
5. What is the difference between isometric projection and isometic ie   a c   ow the draw commands are different from modify commands?   .

SECTION-B

Answer FIVE questions choosing at least one from ℓ'''IIU:A...u,lll,...,   (5Qx10M =SOM)

UNIT-I

6. A circle of 30mm diameter rolls on the concave si   gene t g circle of radius 30mm. Draw the path traced by a point on the <u>generatin c·</u>   ne complete revolution.

(OR)

7. A rectangular field of 0.54 hectare is reP.r ente map by a rectangle of 3cmx2cm.Draw the diagonal scale to read up **to an** long enough to measure up to 600m.Mark a length of 425m.

T-11

8. A line AB 50 mm   I.P and V.P. It is inclined at 30° to H.P and 45 ᴛᴏ V.P. Draw its projections an   e₁ traces.

(OR)

9. Draw the projectiofsyegular hexagon of25mm side, having one of its sides in the H.P. and inclined at 60°to   V.P., and its surface making an angle of 45° degrees with H.P.

UNIT-ID

10. Draw the projections of a hexagonal pyramid of side of base 25 mm and axis 50 mm long resting on one of its base edges in HP with its axis inclined at 30°to HP. and the top view of axis is.45° to VP.

(OR)

11. A cube of 50 mm long edges is so placed on HP on one corner that a body diagonal is Parallel to HP and perpendicular to VP. Draw its projections.

UNIT-IV

12. A Hexagonal Pyramid of side of base 50 mm and length of axis 100 mm is kept on the ground on its base and one of its base edge is parallel to VP. It is cut by inclined plane at 45° to the axis at mid point of it. Draw the development of lateral surfaces of the pyramid of base.

P.T.O.

(OR)

13. A cylinder of 50 mm diameter and axis is 70mm long stands with its base on HP. It is completely penetrated by a horizontal cylinder of 20 mm diameter and 70 mm long such that their axes bisect each other at right angles. The axis of the penetrating cylinder is parallel to VP. Draw the projections showing curves of intersection.

UNIT-V

14. Draw the isometric projection of a rectangular block of I00 mm x 50 mm x 12 mm when it is resting on large surface. It hns two through holes in the center of large surface. They are located at equal distance. The distance between the two centers of holes is 60 mm. The shape of one hole is square of 10 mm and other is circular hole of 1O mm diameter and one vertical face of square hole is parallel to vertical faces ofrectangular block,

(OR)

15. Draw the,
    i) Front view.
    ii) Top View and
    iii) Side view.
    of the Following Isometric Drawing.
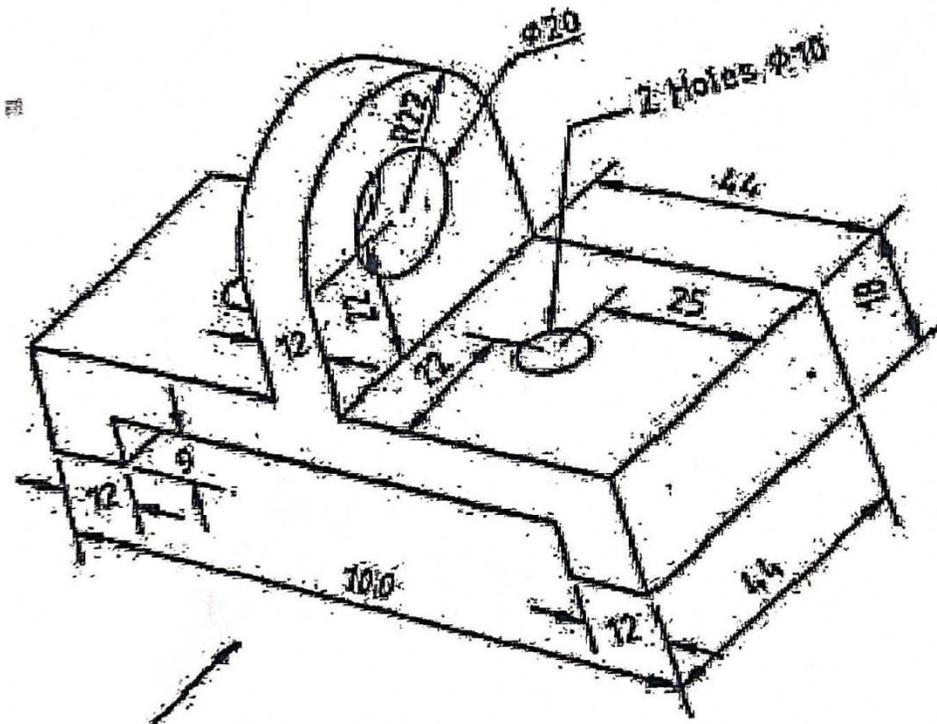
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I B.Tcch I Semester   (REGULAR)   End Examinations July- 2021

ENGINEERING GRAPHICS

16/07/2021   (Common to CIVIL and MECH.)   Day· 5 (FN)

Duration: 3 Hrs   Maximum Marks: 70M

SECTION-A

Answer all the following questions.   (5Qx 4M = 20M)

1. What is meant by conic section?
2. A point A is 30mm above HP and 40mm in front of VP. Another point B is 60mm behind VP and 50mm below HP. Draw the projections of the points A & B keeping the projector distance as 100mm. Draw straight lines joining front views and top views.
3. A cube of35 mm long edges is resting on the H.P. on one of its faces with a efticalface in lined at 30° to the V.P. lt is cut by a section plane parallel to the V.P. and 9 m   the runs and further away from the V.P. Draw its sectional front view and the top vJeyv.
4. A frustum ofa square pyramid has its base 50 mm side, top 25   ln_9 h ght 75 mm. Draw the development of its lateral surface.
5. Draw the isometric view of a cube of 20 mm base.

SECTION-B :\._ :

Answer FIVE questions choosing at **(´izt**   (5Qx10M =SOM)

UNIT-f'< ..._

6. Construct a scale of 1:5 to show decimeters **an, rs** and to read upto 1 meter. Show the length of 7.6dm on it.

(OR) 7

7. The distance of the fixed point fromji{fi xt' . i_ is equal to 40 mm and eccentricity is equal to 2/3. Construct an ellipse and dra 'i'hormal and tangent to the curve at any point on it.

ONIT-II

8. A line PQ 75mm long has its e d in th H.P. and V.P. lt is inclined at an angle of30° to H.P. and 45° to V.P. Draw the **pr on-** ' the line.

(OR)

9. Draw the projections of a circ of 75mm diameter having the end A of the diameter AB in the HP and end B in t VP iritd the surface inclined at 30° to HP and at 60° to the VP.

UNIT-ID

IO. A hexagonal pyramid base 25 mm side and axis 55 mm long has one of its slant edges on the ground. A plane containing that edge and the axis is perpendicular to the H.P and inclined at 45° to the V.P. Draw its projections when the apex is nearer the V.P than the base.

(OR)

11. A square prism of 30 mm base edges and 60 mm long is resting on a longer edge on the ground. Its axis is 450 to the VP. A section plane parallel to HP cuts the object. It is 30 mm from the longer edge which is on the ground. Draw the sectional view from the above.

UNIT-IV

12. A hexagonal prism, edge of base 20 mm and axis 50 mm long, rests with its base on H.P such that one of its rectangular faces is parallel to V.P. It is cut by a plane perpendicular to V.P, inclined at 450 to H.P and passing through the right comer of the top face of the prism develop the lateral surface of the truncated prism.
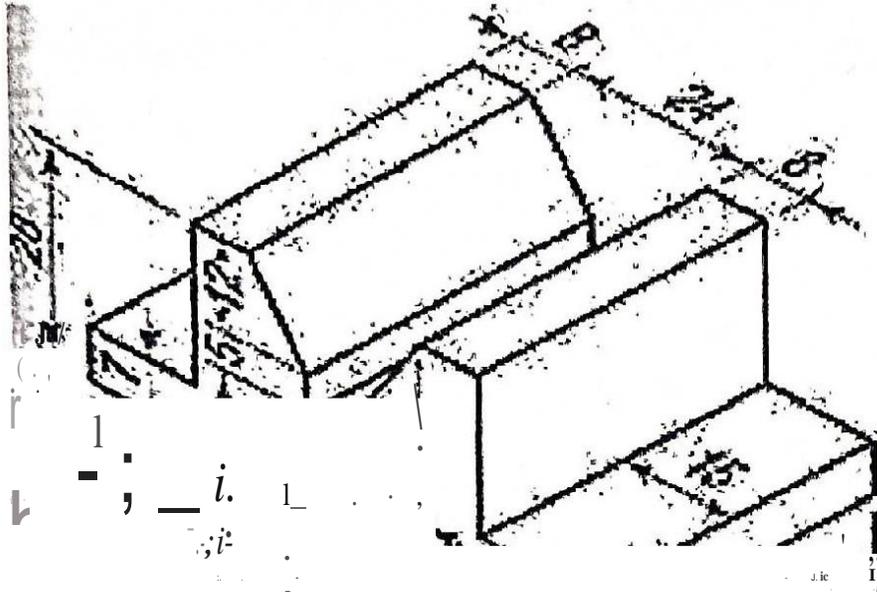
(OR).

P,T.O.

13. A vertical squa.re prism, buse 50 mm side and height 90 mm has a face 1nclincd at 30° to the 1/.J;>. It is completely penetrated by another square prism, base 38 mm side nnd axis mo mm Jong, faces of which are equally inclined to the V.P. Th axes of the two prisms are pnrallcl to the V.P. and bisect ench other at right angles. Draw the projections showing lines of intersection.
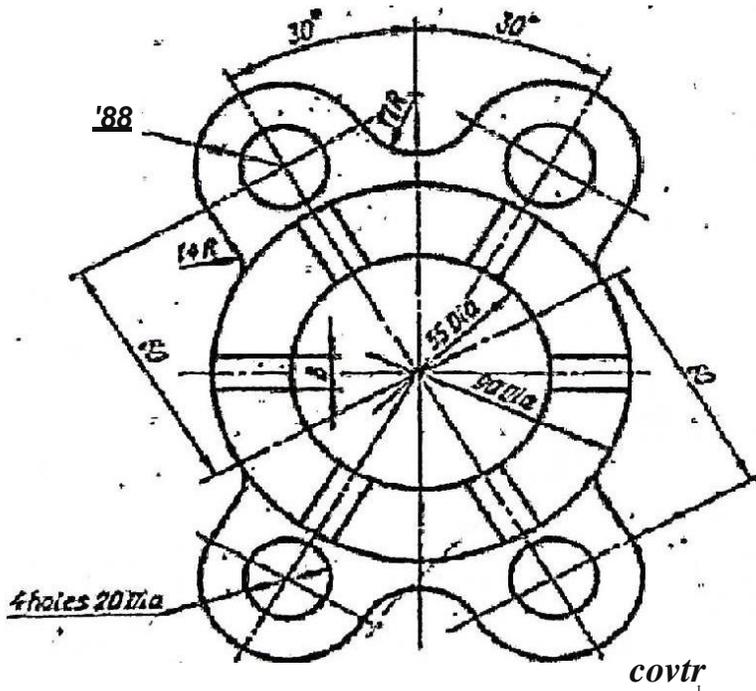
UNIT-V

14. Draw the front view, top view and the side view for the Object sh wn below.

OR

15. List and explain the commandtfhvol inpreparing the drawing shown below.

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I B.Tech I Semester (SUPPL.) • End Examinations July - 2021
ENGINEERING GRAPHICS
(Common to C , MECH, and ECE.) Day - 5 (AND

16/07/2021
Duration: 3 Hrs Maximum Marks: 70M

SECTION-A

Answer all the following questions. (5Q x 4M = 20M)

1. Construct a scale to measure one-tenth of *fnn:* and mm in which 0.5mm on a part is represented by a line of 10mm. Mark a length of 2.4mm.
2. A point Dis lying on both H.P and V.P. Draw its projections.
3. Draw the projection of a cylinder of base 40 diameter and the axis is 60 long, when it is resting on H.P on one of its base.
4. What are the different methods of development? Explain.
5. What do you understand by World Coordinate System (WCS) and Us oo rtatlSystem?

SECTION-B

Answer FIVE questions choosing at least one from each t . (5Q x lOM = SOM)

T-1

6. The distance between the foci of a hyperbola is 100, s are 15 from the foci. Draw the two branches of the hyperbola.

7. A wheel of 500 diameter rolls on a str:ight lip. Trace the path of point on one of the spokes 75 from the rim and for one co the point is vertically above the centre of the when in the starting position.

8. A line PQ of 100 length is inclined le of 30° to H.P and 45° to V.P. The point P is 20 above H.P. and 25 in front of v:P: d]HO from right profile plane. Draw the front view, top view and left side view O(Jffii¥FQ.

(OR)

9. Draw the projection of a 91cle?)O diameter, resting on V.P on a point on the circumference. The plane is incl ; 4'5° to V.P and perpendicular to H.P. The centre of the plane is 30 above the H.P.

UNIT-ID

10. Draw the projections of a hexagonal prism of base 30 side and axis of 70 long, when it is resting on one of its corners of the base on H.P. Consider the axis of the solid is inclined at 45° to H.p.

(OR)

11. Draw the projections of a cylinder of diameter 50 and 90 long that has its axis inclined at 45° to V.P. and 30° to H.P.

UNIT-IV

12. A cube of 40 edge, is resting on a face on H.P, such that a vertical face is inclined at 30° to V.P. It is cut by a section plane perpendicul to V.P and inclined to H.P. at 45° and passing through o : 10 fr m the top end of the axis. D:::p the lateral surface of the lower portion of

13. A vertical square prism of base 40 side, is enctrated by a horizontal square prism of 30 base side such that, the axes are 5 apart, The axis of the horizontal prism ls parallel to V.P. and the aces of both the prisms are equally inclined to V.P. Draw the projections of the two prisms, showmg the lines of intersection.

14. A hexagonal prism with side of base 30 and axis 60 long, rests centrally on one of its rectangular faces, on a cylindrical bloc of 70 diameter and 20 thick. The cylindrical block rests on its base on H.P. and the axis of the prism is perpendicular to V.P. Draw the isometric view of the combination of the two solids.

(OR)

5. Draw the standard three views of the following figure.

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(An Autonomous Institution Under2 f) I N £· ERlNC &T FCIIN OLOC *y*
1 B.Tech - I Semester .I MidT(and| 2(B? of GC Act 1956, New Delhi)
erm Exanunahons, September. 2018
Rl BM E Dl1 02) ENGINEERING GRAPHICS
(Common to CIVIL, MECH, ECE)

04

Durat on: 90Mins

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                                    Section -A   Max Marks: *15M*

Answer *All* the questions

Marks: 5Qx1M = SM

1. Define cycloid, epicycloids and hypocycloid.
2. \1/hat is orthographic Projection?
3. Define Reference line.
4. What is meant by frustum of solids?
5. Define truncated of the solids?.

Sec ti on - B

Answer any TWO questions

Marks: 2Qx5M = l0M

6. A point P of the hyperbola is si:tuated at a distance of 35gun and 5 from the pair of asymptotes. The asymptotes are perpendicular to each other. Draw a hyperbola using orthogonal asymptotes method.

7. 'A coin of 40mm diameter rolls over horizorital table without slipping. A point on the circumference of the coin is in contact with the table surface in the beginning and after one complete revolution. Ora\\ the path traced by the point. Also draw a tangent and normal at any point onlhe curve.

8. Draw the Projecti0ns of following points on the same ground line, keeping the projectors 40 mm apart. Also give dimensions.
   a) Point A is situated 20mm above the II.P and in f ontof the V.P
   b) Point B is situated 20 mm above the H.P and behind the V.P
   c) Point C is in the H.P and 45 mm in front of the V.P
   d) Point D is 30 mm above U1c H.P and is in the V.P
   e) Point E is situated in both the H.P and m the V.P

9. Acy lin der of base diameter 50mm and axis 70mm has a gene!'lltor 111 e th V p and inclined at 45°to the H.P.Draw its projections.

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(R18MED1102) UNGINl!ElHNC CRAPHICS®

(Common to CIVIL₁ MECH, ECl!)

Duration: 90Mins

111 Day AN-1

Sec tion - A

Max Marki:15M

Answer *All* the questions

Marks: 5Qx1M = 5M

I. Enlist the various instruments used in engineering drawing practice.

Define conic. Write the eccentricity of
   i) Ellipse ii) Parabola iii)*l* lypcrbola iv) Rectangular hyperbola.

3. Shew the symbol of first angle and third angle pFojectrons.

4. \Vhat is an oblique plane?

5. What are solids oftevolution? Give three examples and their formatiQll.

Section- *B*

Answer any TI.YO questions

Marks: 2Qx5M =lOM

6. The foci of an elHpse are 90mm apart and the minor axis is 65mm long. Find the length of the major a.xis and draws half the ellipse by concentric circle method and half ellipse by oblongmethod.

7. Construct a scale of I: I4 to read feet and inches-and long- enough to measures 7 feet. Sho11, a Jistance of 5feet IOincl1es on it.

8. State the quadrants in wh.ich the following points are located:
   A- front and top views are abov.e xy,
   B - front view below *xy* and lop view above xy.
   C- front view above xy and top view below xy.
   D - front and top views ate below*xy.*

9. A hexagonal pyramid of base edge JOmtn and axis 60mm, is lying o   !ant edge o the ground , iih the axis patallel to the V.P. D.i;aw its projection when the face oontammg the resting edge are cquall) inclined lo lhe H.P.

APPLIED PHYSICS LAB

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)

B.Tech. - I Year – I Semester

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(R20EAP12L1) APPLIED PHYSICS LAB

List of Experiments:

1. VI Characteristics of PN junction diode:

2. Solar Cell:
    To study the V-I Characteristics of solar cell.

3. Light emitting diode:
    Plot V-I and P-I characteristics of light emitting diode.

4. Hall effect:
    To determine Hall co-efficient of a given semiconductor.

5. Photoelectric effect:
    To determine work function of a given material.

6. LASER:
    To study the characteristics of LASER sources.

7. Optical fibre:
    To determine the bending losses of Optical fibres.

8. BH Curve
    To study the Phenomena of Magnetic Hysteresis loop

LIST OF EXPERIMENTS

S.No	Name Of The Experiment
1	VI Characteristics of PN junction diode
2	Solar Cell: To study the V-I Characteristics of solar cell.
3	Light emitting diode: Plot V-I and P-I characteristics of light emitting diode.
4	Hall effect: To determine Hall co-efficient of a given semiconductor.
5	Photoelectric effect: To determine work function of a given material.
6	LASER: To study the characteristics of LASER sources.
7	Optical fiber: To determine the bending losses of Optical fibers.
8	BH Curve To study the Phenomena of Magnetic Hysteresis loop
9	LCR Circuit: To study the resonance in LCR circuit
10	To study the V-I characteristics of PIN diode

Additional Experiments

Exp No.	Name of the experiment
1	Energy gap: Energy gap of material of p-n junction.
2	Optical fiber: To study the bending losses of optical fiber.

	Sub. Code & Title		(R20EAP12L1)APPLIED PHYSICS LAB		
	Academic Year:2021-22		Year/Sem./Section	I/I/ECE(A,B,C,D)	
	Faculty Name & Designation				

S. N o.	Topi c (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of hours	Actual Date of Handled	CO/RBT
			Fro m	To				
1	VI Characteristics of PN junction diode	Manual			Demonstration on Black Board & Apparatus			L3
2	Solar Cell: To study the V-I Characteristics of solar cell.	Manual			Demonstration on Black Board & Apparatus	3		L3
3	Light emitting diode: Plot V-I and P-I characteristics of light emitting diode.	Manual			Demonstration on Black Board & Apparatus			L5
4	Hall effect: To determine Hall co-efficient of a given semiconductor.	Manual			Demonstration on Black Board & Apparatus			L3
5	Photoelectric effect: To determine work function of a given material.	Manual			Demonstration on Black Board & Apparatus			L5
6	LASER: To study the characteristics of LASER sources.	Manual			Demonstration on Black Board & Apparatus			L5
7	Optical fiber: To determine the bending losses of Optical fibers.	Manual			Demonstration on Black Board & Apparatus	3		L5
8	BH Curve To study the Phenomena of Magnetic Hysteresis loop	Manual			Demonstration on Black Board & Apparatus			L5
9	LCR Circuit: To study the resonance in LCR circuit	Manual			Demonstration on Black Board & Apparatus			L3
10	To study the V-I characteristics of PIN diode	Manual			Demonstration on Black Board & Apparatus	3		L5
11	Energy gap: Energy gap of material of p-n junction.	Manual			Demonstration on Black Board & Apparatus			L5

12	Optical fiber: To study the bending losses of optical fiber.	Manual			Demonstration on Black Board & Apparatus			L5

PROGRAMMING FOR PROBLEM SOLVING

LAB

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)

B.Tech. - I Year – I Semester

L	T	P	C
0	0	3	1.5

(R20CSE11L2) PROGRAMMING FOR PROBLEM SOLVING LAB

[Note:The programs may be executed using any available Open Source/ Freely available IDE
Some of the Tools available are:
CodeLite: https://codelite.org/
Code::Blocks: http://www.codeblocks.org/
DevCpp : http://www.bloodshed.net/devcpp.html
Eclipse: http://www.eclipse.org
This list is not exhaustive and is NOT in any order of preference]

Course Objectives: The students will learn the following:
- To work with an IDE to create, edit, compile, run and debug programs
- To analyze the various steps in program development.
- To develop programs to solve basic problems by understanding basic concepts in C like operators, control statements etc.
- To develop modular, reusable and readable C Programs using the concepts like functions, arrays etc.
- To Write programs using the Dynamic Memory Allocation concept.
- To create, read from and write to text and binary files

Course Outcomes: The candidate is expected to be able to:
- formulate the algorithms for simple problems
- translate given algorithms to a working and correct program
- correct syntax errors as reported by the compilers
- identify and correct logical errors encountered during execution
- represent and manipulate data with arrays, strings and structures
- use pointers of different types
- create, read and write to and from simple text and binary files
- modularize the code with functions so that they can be reused

Practice sessions:
a. Write a simple program that prints the results of all the operators available in C (including pre/ post increment , bitwise and/or/not , etc.). Read required operand values from standard input.
b. Write a simple program that converts one given data type to another using auto conversion and casting. Take the values form standard input.

Simple numeric problems:
a. Write a program for find the max and min from the three numbers.
b. Write the program for the simple, compound interest.
c. Write program that declares Class awarded for a given percentage of marks, where mark <40%= Failed, 40% to <60% = Second class, 60% to <70%=First class, >= 70% = Distinction. Read percentage from standard input.

d. Write a program that prints a multiplication table for a given number and the number of rows in the table. For example, for a number 5 and rows = 3, the output should be:

   5 x 1 = 5

   5 x 2 = 10

   5 x 3 = 15

e. Write a program that shows the binary equivalent of a given positive number between 0 to 255.

Expression Evaluation:

a. A building has 10 floors with a floor height of 3 meters each. A ball is dropped from the top of the building. Find the time taken by the ball to reach each floor. (Use the formula $s = ut+(1/2)at^2$ where u and a are the initial velocity in m/sec (= 0) and acceleration in m/sec^2 (= 9.8 m/s^2)).

b. Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

c. Write a program that finds if a given number is a prime number

d. Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.

e. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

f. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

g. Write a C program to find the roots of a Quadratic equation.

h. Write a C program to calculate the following, where x is a fractional value. $1-x/2 +x^2/4-x^3/6$

i. Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression: $1+x+x^2+x^3+\ldots\ldots\ldots+x^n$. For example: if n is 3 and x is 5, then the program computes 1+5+25+125.

Arrays and Pointers and Functions:

a. Write a C program to find the minimum, maximum and average in an array of integers.

b. Write a functions to compute mean, variance, Standard Deviation, sorting of n elements in single dimension array.

c. Write a C program that uses functions to perform the following:

   i. Addition of Two Matrices

   ii. Multiplication of Two Matrices

   iii. Transpose of a matrix with memory dynamically allocated for the new matrix as row and column counts may not be same.

d. Write C programs that use both recursive and non-recursive functions

   i. To find the factorial of a given integer.

   ii. To find the GCD (greatest common divisor) of two given integers.

   iii. To find x^n

e. Write a program for reading elements using pointer into array and display the values using array.

f. Write a program for display values reverse order from array using pointer.

g. Write a program through pointer variable to sum of n elements from array.

Files:

a. Write a C program to display the contents of a file to standard output device.

b. Write a C program which copies one file to another, replacing all lowercase characters with their uppercase equivalents.

c. Write a C program to count the number of times a character occurs in a text file. The file name and the character are supplied as command line arguments.

d. Write a C program that does the following:
It should first create a binary file and store 10 integers, where the file name and 10 values are given in the command line. (hint: convert the strings using atoi function) Now the program asks for an index and a value from the user and the value at that index should be changed to the new value in the file. (hint: use fseek function)
The program should then read all 10 values and print them back.

e. Write a C program to merge two files into a third file (i.e., the contents of the firs t file followed by those of the second are put in the third file).

Strings:

a. Write a C program to convert a Roman numeral ranging from I to L to its decimal equivalent.

b. Write a C program that converts a number ranging from 1 to 50 to Roman equivalent

c. Write a C program that uses functions to perform the following operations:
i. To insert a sub-string in to a given main string from a given position.
ii. To delete n Characters from a given position in a given string.

d. Write a C program to determine if the given string is a palindrome or not (Spelled same in both directions with or without a meaning like madam, civic, noon, abcba, etc.)

e. Write a C program that displays the position of a character ch in the string S or −1 if S doesn't contain ch.

f. Write a C program to count the lines, words and characters in a given text.

Miscellaneous:

a. Write a menu driven C program that allows a user to enter n numbers and then choose between finding the smallest, largest, sum, or average. The menu and all the choices are to be functions. Use a switch statement to determine what action to take. Display an error message if an invalid choice is entered.

b. Write a C program to construct a pyramid of numbers as follows:

```
1              *         1        1            *
1 2            * *       2 3      2 2          * *
1 2 3          * * *     4 5 6    3 3 3        * * *
                                 4 4 4 4       * *
                                              *
```

Sorting and Searching:

a. Write a C program that uses non recursive function to search for a Key value in a given

b. list of integers using linear search method.

c. Write a C program that uses non recursive function to search for a Key value in a given

d. sorted list of integers using binary search method.

e. Write a C program that implements the Bubble sort method to sort a given list of

f. integers in ascending order.

g. Write a C program that sorts the given array of integers using selection sort in descending order

h. Write a C program that sorts the given array of integers using insertion sort in ascending order

i. Write a C program that sorts a given array of names

Suggested Reference Books for solving the problems:

i. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

ii. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)

iii. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

iv. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression)

v. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.

vi. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

B.TECH – DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Academic Year: 2021-2022 B.Tech I Year I Sem

(R20CSE11L2)PROGRAMMING FOR PROBLEM SOLVING LAB

LIST OF PROGRAMS

S.No	Name Of The Experiment
1	**a.** Write a simple program that prints the results of all the operators available in C (including pre/ post increment, bitwise and/or/not, etc.). Read required operand values from standard input. **b.** Write a C program, which takes two integer operands and one operator from the user, performs the following operations using switch statement. i) Addition ii) Subtraction iii) Multiplication iv) Division v) Modulus **c.** Write a C program to find the roots of a quadratic equation.
2	**a.** Write a C program for finding the maximum and minimum of three numbers using if...else statement. b.Write a C program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and English, calculate percentage and grade according to given conditions: If percentage >= 90% : Grade A If percentage >= 80% : Grade B If percentage >= 70% : Grade C If percentage >= 60% : Grade D If percentage >= 40% : Grade E If percentage < 40% : Grade F
3	**a.** Write a C program that takes an integer number as input and output the reverse of the same with suitable messages. Ex: Number: 2014 Reverse: 4102. **b.** Write a C program to evaluate the following using loops i)$1+x^2/2!+x^4/4!+...$upto 5 terms ii) $x+x^3/3!+x^5/5!+...$upto 5 terms c.Write a C program to generate all the prime numbers between 1 and n – where n is a value supplied by the user.
4	**a.** Write a C program to generate Pascal's triangle.
	b. Write a C program to generate the first n terms of the Fibonacci sequence.
5	**a.** Write a C program to sort array of elements in ascending order.

	b. Write a C program to find the transpose of a given matrix.
	c. Write a C program that uses two dimensional arrays to perform the addition of two matrices.
6	**a.** Write a C program to find the minimum and maximum element in an array.
	b. Write a C program that uses two dimensional arrays to perform the multiplication of two matrices by checking the compatibility.
7	**a.** Write a C Program that reads two integers and calls SUM(a, b) function that takes two integer arguments and returns their sum of two integers. The SUM(a, b) function should calculate the sum of two integer values.
	b. Write C programs to find the following using function.
	i. To find the factorial of a given integer.
	ii. To solve Towers of Hanoi problem.
	c. write a C program to find the GCD (Greatest Common Divisor) of two given integers.
8	**a.** Write a C Program to find the frequency of characters occurs in a String.
	b. Write a C program to perform the following operations using string handling functions
	i) To concatenate two strings.
	ii) To compare two strings.
	c. Write a C program that uses string handling function to determine if the given string is a palindrome or not.
9	Create a structure named company which has name, address, phone and no Of Employee as member variables. Read name of company, its address, and phone and no of Employee. Finally display these members' value.
10	**a.** Write a C program that uses structure concept to perform the following operations:
	i. Addition of two complex numbers
	ii. Multiplication of two complex numbers
	b.Write a C program to pass address of structure variable to user-defined function and display the contents.
11.	**a.** Write a C program to illustrate the following pointer arithmetic operation
	i) Incremented (++)
	ii) Decremented (--)
	iii) An integer added to a pointer (+ or +=)
	iv) An integer subtracted from a pointer (– or -=)
	b. Write a C program to find the largest value in the array using pointer.
	c. Write a C program to swap value of two variables using pointer (Note: call by reference).

12	**a.** Write a C program to allocate memory to a pointer variable using malloc() function. Determine the number of bytes to allocate according to user requirements. **b.** Write a C program to demonstrate the reallocate the allocated memory using realloc() function. **c.** Write a C program to the find sum of all the elements in one dimensional array using Dynamic Memory Allocation.

13	Write C programs to find the following using Recursive function.
	      i. To find the factorial of a given integer.
	      ii. To solve Towers of Hanoi problem.

14	**a.** Write a C program to use the identifier for 3.14 as PI to find the area of circle. **b.** Write a C program to use conditional compilation directive statements as to whether the identifier is defined or not. **c.** Write a C program to identify whether the entered character is a letter or a digit or an upper case letter or a lower case one using predefined macros.
15	**a.** Write a C program which reads a text file given by user and display its contents on screen. **b.** Write a C program to count the lines, words and characters in a given text. **b.** Write a C Program to merge contents of two files into a third file.
16	Write a C program to search an element from the list of integers i. Linear search ii. Binary search method
17	Write a C program that implements the following sorting techniques i. Bubble sort ii. Selection sort
18	Write a C program that sorts the given array of integers using insertion sort in the order

	Sub. Code & Title		**(R20CSE11L2)PROGRAMMING FOR PROBLEM SOLVING LAB**			

Academic Year:2021-22		**Year/Sem./Section**		**I-I/ECE**

Faculty Name & Designation		**D. Mounika, Asst.Professor**

S.No.	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of hours	Actual Date of Handle d	CO/RBT
						53		
1	Solve a problem to develop a solution to display "hello world"	R2	1.25	1.25	BlackBoard & Demonstration On Projector	3		CO1/L3
2	Solve a problem to design a solution for addition.	R2	1.26	1.26	Demonstration On Projector			CO1/L3
3	Write a sample program to design a solution for subtraction, multiplication.	R2	1.26	1.26	Demonstration On Projector			CO2/L6
4	Use the formula Area=pi*r*r to design a solution for finding area of a circle.	R1	102	102	Demonstration On Projector	3		CO1/L3
5	Write a sample program to design a solution for finding area of a triangle, circumference of a circle	R1	103	103	Demonstration On Projector			CO1/L6
6	Write a simple program that prints the results of all the operators available in C	R1	49	56	Demonstration on Projector			CO2/L6
7	Write a C program, which takes two integer operands and one operator from the user, performs the following operations using Switchi)Addition,ii)Subtraction,iii)Multiplication,iv) Division v)Modulus.	R2	5.2	5.42	Demonstration on Projector	3		CO1/L6
8	Develop a solution to find the given number is even or odd.	R2	5.2	5.4	Black Board &Demonstrat ion on Projector			CO1/L6
9	Use if -else statement to find greatest of two numbers.	R2	5.4	5.5	Black Board			CO2/L3
10	Write a C program to find the roots of a quadratic equation	R2	1.25	1.26	Black Board &Demonstraion on Projector	2		CO1/L6
11	Write a C program for finding the maximum and minimum of three numbers using if...else statement.	R2	1.26	1.27	Black Board &Demonstration on Projector			CO1/L6
12	Write a C program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and English, calculate percentage and grade according to given conditions: IF I)percentage>=90%:GradeA II)percentage>=80%:GradeB	R2	1.27	1.28	Black Board &Demonstration on Projector			CO1/L6

Sub. Code & Title	(R20CSE11L2)PROGRAMMING FOR PROBLEM SOLVING LAB		
Academic Year:2021-22		Year/Sem./Section	I-I/ECE
Faculty Name & Designation		D.Mounika, Asst.Professor	

S. No	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of hours	Actual Date of Handled	CO/RBT
13	Develop a C program for an electricity power distribution company charges its domestic consumers Consumption units Rate(unit) 0-200 Rs.5 201-300 Rs.8 301-above Rs.11	R2	1.28	1.29	Black Board	1		CO1/L6
14	Use for loop and write a program to print "PPS" 10 times.	R2	6.2	6.4	Black Board			CO1/L3
15	Write a C program that takes an integer number as input and output the reverse of the same with suitable messages. Ex: Number: 2014 Reverse: 4102.	R2	6.4	6.6	Black Board &Demonstration on Projector			CO1,CO2/L6
16	Develop a program to find sum of individual digits.	R2	6.6	6.7	Black Board			CO1/L6

17	Write a C program to evaluate the following using loops
	    i)$1+x^2/2!+x^4/4!+$...upto 5 terms
	    ii) $x+x^3/3!+x^5/5!+$...upto 5 terms
		R2	6.8	6.9	Black Board &Demonstration on Projector	3		CO1/L6

18	Write a C program to generate all the prime numbers between 1 and n – where n is a value supplied by the user.	R2	6.9	6.9	Black Board &Demonstration on Projector			CO1/L6
19	Write a C program to generate Pascal's triangle.	R2	6.9	6.9	Black Board &Demonstration on Projector			CO1/L6
20	Write a C program to generate the first n terms of the Fibonacci sequence.	R2	6.9	6.9	Black Board &Demonstration on Projector			CO1,CO2/L6
21	Write a C program to read and display elements of an one dimensional array	R2	7.2	7.4	Black Board &Demonstration on Projector	3		CO1,CO3/L6
22	Write a C program to sort array of elements in ascending order.	R2	7.3	7.4	Black Board &Demonstration on Projector			CO1,CO3/L6

S.No	Topic (s)	Book Reference	Page (s) From	To	Teaching Methodology	Proposed No. of hours	Actual Date of Handled	CO/RBT
23	Write a C program to find the transpose of a given matrix.	R2	7.3	7.4	Black Board &Demonstration on Projector	2		CO1,CO3/L6
24	Write a C program that uses two dimensional arrays to perform the addition of two matrices	R2	7.5	7.6	Black Board &Demonstration on Projector			CO1,CO3/L6
25	Write a C program to find the minimum and maximum element in an array.	R2	7.5	7.6	Black Board &Demonstration on Projector	3		CO1,CO2/L6
26	Write a C program that uses two dimensional arrays to perform the multiplication of two matrices by checking the compatibility.	R2	7.5	7.6	Black Board &Demonstration on Projector			CO1/L6
27	Write a C program to read and display elements of multi -dimensional array	R2	7.5	7.6	Black Board &Demonstration on Projector			CO1/L6
	Review		Signature of the HOD/Coordinator					
28	Write a C Program that reads two integers and calls SUM(a, b) function that takes two integer arguments and returns their sum of two integers. The SUM(a, b) function should calculate the sum of two integer values.	R1	174	175	Black Board	3		CO2,CO3/L6
29	Write C programs to find the following using function to find the factorial of a given integer.	R1	175	176	Black Board &Demonstration on Projector			CO2,CO3/L6
30	Write C programs to find the following using function to solve Towers of Hanoi problem.	R1	176	177	Black Board &Demonstration on Projector			CO2,CO3/L6
31	write a C program to find the GCD (Greatest Common Divisor) of two given integers	R1	177	178	Black Board &Demonstration on Projector			CO2,CO3/L6
32	Write a C Program to find the frequency of characters occurs in a String.	R2	8.2	8.5	Black Board &Demonstration on Projector	1		CO2,CO3/L6

		SRI INDU COLLEGE OF ENGG & TECHNOLOGY **LESSON PLAN** **(Regulation :R20)** **Department of Electronics and Communication Engineering**		**Prepared on :4.10.2021**
	Sub. Code & Title	**(R20CSE11L2)PROGRAMMING FOR PROBLEM SOLVING LAB**		
	Academic Year:2021-22	**Year/Sem./Section**	**I-I/ECE**	
	Faculty Name & Designation	**D.Mounika, Asst.Professor**		

S.No	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Propose d No. of hours	Actual Date of Handled	CO/RBT
33	Write a C program to perform the following operations using string handling functions i) To concatenate two strings. ii) To compare two strings.	R2	8.21	8.31	Black Board &Demonstratio n on Projector	2		CO2,CO3/L6
34	Write a C program that uses string handling function to determine if the given string is a palindrome or not.	R2	8.37	8.39	Black Board &Demonstrati on on Projector			CO2,CO3/L6
35	Develop a C code to find length, copy, compare strings without using string functions	R2	8.38	8.39	Black Board	3		CO2,CO3/L6
36	Create a structure named company which has name, address, phone and no Of Employee as member variables. Read name of company, its address, and phone and no of Employee. Finally display these members' value.	R2	9.25	\ 9.26	Black Board &Demonstration on Projector			CO2,CO3/L6
37	Write a C program that uses structure concept to perform the following operations: Addition of two complex numbers Multiplication of two complex numbers	R2	9.26	9.27	Black Board &Demonstration on Projector	3		CO2,CO3/L6
38	Write a C program to pass address of structure variable to user-defined function and display the contents	R1	370	371	Black Board &Demonstration on Projector			CO2,CO3/L6
	Review	**Signature of the HOD/Coordinator**						
39	Write a C program to illustrate the following pointer arithmetic operation i. Incremented (++) ii. Decremented (--) iii. An integer added to a pointer (+ or +=) An integer subtracted from a pointer (– or -=)	R2	10.1	10.2	Black Board &Demonstration on Projector	2		CO2,CO3/L6
40	Write a C program to find the largest value in the array using pointer.	R2	10.2	10.3	Black Board			CO2,CO3/L6

		Sub. Code & Title		**(R20CSE11L2)PROGRAMMING FOR PROBLEM SOLVING LAB**			
		Academic Year:2021-22		**Year/Sem./Section**	**I-I/ECE**		
		Faculty Name & Designation		**D.Mounika, Asst.Professor**			

S.No	Topic (s)	Book Reference	Page (s) From	To	Teaching Methodology	Proposed No. of hours	Actual Date of Handled	CO/RBT
41	Write a C program to swap value of two variables using pointer (Note: call by reference).	R2	15.46	15.48	Black Board	3		CO2,CO3/L6
42	Write a C program to allocate memory to a pointer variable using malloc() function. Determine the number of bytes to allocate according to user requirements.	R1	294	295	Black Board			CO2,CO3/L6
42	Write a C program to demonstrate the reallocate the allocated memory using realloc() function.	R1	295	296	Black Board &Demonstration on Projector			CO2,CO3/L6
43	Write a C program to the find sum of all the elements in one dimensional array using Dynamic Memory Allocation	R1	296	297	Black Board &Demonstration on Projector			CO2,CO3/L6
44	Write C programs to find the following using Recursive function .to find the factorial of a given integer.	R1	194	195	Black Board &Demonstration on Projector			CO2,CO3/L6
45	Write C programs to find the following using Recursive function to solve Towers of Hanoi problem.	R1	196	197	Black Board &Demonstration on Projector	3		CO2,CO3/L6
46	Write a C program to use the identifier for 3.14 as PI to find the area of circle.	R1	458	460	Black Board &Demonstration on Projector			CO2,CO3/L6
Review			**Signature of HOD /Coordinator**					
47	Write a C program to use conditional compilation directive statements as to whether the identifier is defined or not	R1	460	462	Black Board &Demonstration on Projector			CO2,CO3/L6
48	Write a C program to identify whether the entered character is a letter or a digit or an upper case letter or a lower case one using predefined macros	R1	465	466	Black Board &Demonstration on Projector	1		CO2,CO3/L6

SRI INDU COLLEGE OF ENGG & TECHNOLOGY
LESSON PLAN
(Regulation :R20)
Department of Electronics and Communication Engineering

Prepared on :4.10.2021

Sub. Code & Title		(R20CSE11L2)PROGRAMMING FOR PROBLEM SOLVING LAB		
Academic Year:2021-22		**Year/Sem./Section**		**I-I/ECE**
Faculty Name & Designation		**D.Mounika, Asst.Professor**		

S.No	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of hours	Actual Date of Handled	CO/RBT
49	Use DOS commands and create a file , view the file from command prompt.	R1	399	402	Black Board &Demonstration on Projector			CO2,CO3/L6
50	Write a C program which reads a text file given by user and display its contents on screen.	R1	403	404	Black Board &Demonstration on Projector	3		CO2,CO3/L3
51	Write a C program to count the lines, words and characters in a given text.	R1	404	405	Black Board &Demonstration on Projector			CO2,CO3/L6
52	Write a C Program to merge contents of two files into a third file.	R1	406	408	Black Board &Demonstration on Projector			CO2,CO3/L6
53	Write a C program to search an element from the list of integers i.Linear search ii. Binary search method	R1	404	405	Black Board &Demonstration on Projector	3		CO2,CO3/L6
54	Write a C program that implements the following sorting techniques i. Bubble sort ii. Selection sort	R2	16.1	16.14	Black Board &Demonstration on Projector			CO2,CO3/L6
55	Write a C program that sorts the given array of integers using insertion sort in the order	R2	16.14	16.16	Black Board &Demonstration on Projector	3		CO2,CO3/L6

Review	**Signature of HOD /Coordinator**

ENVIRONMENTAL SCIENCE

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)

B.Tech. • I Year - I Semester

L T P C
3 0 0 0

(R20HAS1102) ENVIRONMENTAL SCIENCE

Course Objectives:
>   Understanding the importance of ecological balance for sustainable development.
>   Understanding the impacts of developmental activities and mitigation measures.
>   Understanding the environmental policies and regulations

Course Outcomes:
>   Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

UNIT-I
Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Bio magnification, ecosystem value, services and carrying capacity, Field visits.

UNIT-II
Natural Resources: Classification of Resources: Living and Non-Living resources, **water resources:** use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. **Mineral resources:** use and exploitation, environmental effects of extracting and using mineral resources, **Land resources:** Forest resources, **Energy resources:** growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

UNIT-III
Biodiversity And Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT-IV
Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, **Air Pollution:** Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. **Water pollution:** Sources and types of pollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards, **Solid waste:** Municipal Solid Waste management, composition and characteristics of e-Waste and its management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary and Tertiary.

Overview of air pollution control technologies, Concepts of bioremediation. **Global Environmental Issues and Global Efforts:** Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protoc,ol and Monu-eal Protocol. NAPCC-GoI Initiatives.

ELECTRONICS & COMMUNICATION ENGINEERING

UNIT-V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act-1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, bio medical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP). **Towards Sustainable Future:** Concept of Sustainable Development Goals, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Spraw Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

TEXTBOOKS:
1 Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2 Environmental Studies by **R.** Rajagopalan, Oxford University Press.

REFERENCE BOOKS:
1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell **P.** Ela. 2008 **PHI** Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushi.k, 4 th Edition, New age international publishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
6. Introduction to Environmental Science by Y. Anjaneyulu, BS.Publications.

SRI INDU COLLEGE OF ENGG & TECH
LESSON PLAN
(Regulation :R20)
Department of Electronics &Communication Engineering

Sub. Code & Title	(R20ECH1101) ENVIRONMENTAL SCIENCE	
Academic Year: 2021-22	Year/Sem./Section	I/I ECE
Faculty Name & Designation	E.JYOTHI ASSISTANT PROFESSOR.	

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO//RBT
					UNIT – I			
I	**Ecosystems**					10		
1.1	Definition, Scope, and Importance of ecosystem.	T2	1.1	1.4	Black board	1		CO1/L1
1.2	Classification, structure, and function of an ecosystem	T2	1.4	1.5	Model Presentation	2		CO1/L2
1.3	Food chains, food webs	T2	1.9	1.10	Black board	1		CO1/L3
1.4	Ecological pyramids, Flow of energy	T2	1.5	1.9	Black board	1		CO1/L1
1.6	Ecosystem value	T2	1.11	1.12	PPT	1		CO1/L1
1.7	services and carrying capacity, Field visits	T2	1.19	1.20	Black board	2		
	Revision				MCQ's			
	Total Periods					10		
	Review				Signature of the HOD/Coordinator			

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	**Actual Date of Handled**	**CO/RBT**
					UNIT –II			
II	**Natural Resources**					13		
2.1	**Classification of Resources:** Living and Non-Living resources	T2	2.1	2.2	Black board	1		CO2/L2
2.2	**water resources:** use and over utilization of surface and ground water	T2	2.2	2.4	Black board	2		CO2/L4

2.4	Dams: benefits and problems	T2	2.5	2.7	Demonstration	1		CO2/L3
2.5	**Mineral resources:** use and exploitation	T2	2.7	2.8	Demonstration	1		CO2/L3
2.6	Environmental effects of extracting and using mineral resources	T2	2.9	2.12	Black board	2		CO2/L3
2.7	**Land resources:** Forest resources	T2	2.12	2.15	Black board	1		CO2/L2
2.8	**Energy resources:** growing energy needs	T2	2.15	2.17	Black board	1		CO2/L3
2.9	Renewable and non renewable energy sources	T2	2.16	2.17	Black board	1		CO2/L2
2.10	Use of alternate energy source, case studies.	T2	2.20	2.22	Black board	2		CO2/L6
	Revision				Quiz			
	Total Periods					13		
	Review		**Signature of the HOD/Coordinator**					

<table>
<tr><td colspan="9" align="center">UNIT-
III</td></tr>
<tr><td>I</td><td colspan="4">Biodiversity And Biotic Resources</td><td></td><td>12</td><td></td><td></td></tr>
<tr><td>3.1</td><td>Introduction, Definition, genetic</td><td>T2</td><td>3.1</td><td>3.14</td><td>Black board</td><td>1</td><td></td><td>CO3/L2</td></tr>
<tr><td>3.2</td><td>species and ecosystem diversity</td><td>T2</td><td>3.17</td><td>3.21</td><td>Demonstration</td><td>1</td><td></td><td>CO3/L1</td></tr>
<tr><td>3.3</td><td>Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values</td><td>T2</td><td>3.22</td><td>3.24</td><td>Demonstration</td><td>2</td><td></td><td>CO3/L2</td></tr>
<tr><td>3.4</td><td>India as a mega diversity nation</td><td>T2</td><td>3..25</td><td>3.31</td><td>Black board</td><td>1</td><td></td><td>CO3/L5</td></tr>
<tr><td>3.5</td><td>Hot spots of biodiversity</td><td>T2</td><td>3.31</td><td>3.33</td><td>Black board</td><td>1</td><td></td><td>CO3/L5</td></tr>
<tr><td>3.6</td><td>Field visit</td><td>T2</td><td>3.36</td><td>3.38</td><td>PPT</td><td>1</td><td></td><td>CO3/L3</td></tr>
<tr><td>3.7</td><td>Threats to biodiversity: habitat loss</td><td>T2</td><td>3.40</td><td>3.43</td><td>PPT</td><td>1</td><td></td><td>CO3/L2</td></tr>
<tr><td>3.8</td><td>poaching of wildlife</td><td>T2</td><td>3.47</td><td>3.52</td><td>Black board</td><td>1</td><td></td><td>CO3/L1</td></tr>
<tr><td>3.9</td><td>man-wildlife conflicts</td><td>T2</td><td>3.52</td><td>3.55</td><td>Black board</td><td>1</td><td></td><td>CO3/L2</td></tr>
<tr><td>3.10</td><td>conservation of biodiversity: In-Situ and Ex- situ conservation</td><td>T2</td><td>3.55</td><td>3.58</td><td>Black board</td><td>1</td><td></td><td>CO3 /L3</td></tr>
<tr><td>3.11</td><td>National Biodiversity act.</td><td>T2</td><td>3.60</td><td>3.63</td><td>Black board</td><td>1</td><td></td><td>CO3/L4</td></tr>
<tr><td></td><td align="center">Revision</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td align="center">Total Periods</td><td></td><td></td><td></td><td></td><td>12</td><td></td><td></td></tr>
<tr><td></td><td align="center">Review</td><td colspan="4" align="center">Signature of the HOD/Coordinator</td><td></td><td></td><td></td></tr>
</table>

		UNIT-IV						
IV	**Environmental Pollution and Control Technologies**					**17**		
4.1	**Environmental Pollution:** Classification of pollution,	T2	4.5	4.6	PPT	1		CO4/L2
4.2	**Air Pollution:** Primary and secondary pollutants	T2	4.1	4.5	Black board	1		CO4/L2
4.3	Automobile and Industrial pollution	T2	4.15	4.18	Black board	1		CO4/L2
4.4	Ambient air quality standards	T2	4.20	4.21	PPT	1		CO4/L4
4.5	**Water pollution:** Sources and types of pollution	T2	4.21	4.25	Black board	1		CO4/L2
4.6	Drinking water quality standards	T2	4.26	4.26	Black board	1		CO4/L3
4.7	**Soil Pollution:** Sources and types	T2	4.26	4.29	Black board	1		CO4/L2
4.8	Impacts of modern agriculture, degradation of soil	T2	4.33	4.35	Black board	1		CO4/L2
4.9	**Noise Pollution:** Sources and Health hazards, standards	T2	4.29	4.32	Black board	1		CO4/L2
4.10	**Solid waste:** Municipal Solid Waste management	T2			Black board	1		CO4/L2
4.11	composition and characteristics of e-Waste and its management	T2			Black board	1		CO4/L4
4.12	**Pollution control technologies:** Waste water Treatment methods: Primary, secondary and Tertiary	T2			Black board	1		CO4/L2
4.13	Overview of air pollution control technologies, Concepts of bioremediation	T2			PPT	1		CO4/L5
4.14	**Global Environmental Issues and Global Efforts:** Climate change and impacts on human environment	T2			Black board	1		CO4/L2
4.15	Ozone depletion and Ozone depleting substances (ODS).	T2	4.39	4.43	Black board	1		CO4/L2
4.16	Deforestation and desertification					1		
4.17	International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. NAPCC-GoI Initiatives.	T2	4.44	4.46	Black board	1		CO4/L1

		UNIT-V							
V		**Environmental Policy, Legislation & EIA**					**13**		
5.1	Environmental Protection act, Legal aspects Air Act- 1981		T2	10.1	10.9	Black board	1		CO5/L1
5.2	Water Act, Forest Act, Wild life Act		T2	10.2	10.5	Black board	1		CO5/L2
5.3	Municipal solid waste management and handling rules		T2	10.21	10.31	Black board	1		CO5/L2
5.4	biomedical waste management and handling rules, hazardous waste management and handling rules		T2	11.22	11.25	Black board	1		CO5/L1
5.5	EIA: EIA structure, methods of baseline data acquisition		T2	11.27	11.29	PPT	1		CO5/L3
5.6	Overview on Impacts of air, water, biological and Socio-economical aspects		T2	11.32	11.35	Black board	1		CO5/L2
5.7	Strategies for risk assessment, Concepts of Environmental Management Plan (EMP)		T2	11.36	11.37	PPT	1		CO5//L3
5.8	**Towards Sustainable Future:** Concept of Sustainable Development Goals		T2			Black board	1		CO5//L3
5.9	Population and its explosion, Crazy Consumerism		T2			Black board	1		CO5//L3
5.10	Environmental Education, Urban Sprawl, Human health		T2			Black board	1		CO5//L3
5.11	Environmental Ethics, Concept of Green Building		T2			PPT	1		CO5//L3
5.12	Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.		T2			Black board	2		CO5//L3
	Revision					MCQ's			
	Total Periods						13		
	Review		**Signature of the HOD/Coordinator**						

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

1 Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.

2   Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
6. Introduction to Environmental Science by Y. Anjaneyulu, BS.Publications.

WEB REFERENCES FOR ENVIRONMENTAL STUDIES

W1: https://eschooltoday.com/ecosystems/what-is-an-ecosystem.html

W2: https://www.tutorialspoint.com/environmental_studies/environmental_studies_classification_of_ecosystem.htm

W3:   https://www.toppr.com/guides/evs/what-if-it-finishes/materials-resources-and-its-classification/

W4:http://www.yourarticlelibrary.com/biodiversity/biodiversity-types-genetic-species-and-ecological-diversity/44744

W5:https://mashable.com/2015/05/23/biodiversity-threats/#GhHHe2vj5ZqE

W6:   http://www.brainkart.com/article/Classification-of-Pollution_7451/

W7: https://digitalcommons.uri.edu/cgi/viewcontent.cgi?referer=https://www.google.co.in/&httpsredir=1&article=1748&context=theses

W8: http://www.universalenviro.in/environmental_services.html

ASSIGNMENT

SL.No	Assignment Questions	Course Outcome	Books To be Referred	Date of Announcement	Date Of Submission
1	Discuss the significance of food chains and food webs with relevant examples.	CO1	T1	6-1-2022	18-1-2022
2	What are biogeochemical cycles? Explain phosphorous cycle with the help of a diagram.	CO1	T1	6-1-2022	18-1-2022
3	Classify natural resources. What are the different methods of conserving water resource?	CO2	T1	6-1-2022	18-1-2022
4	Explain how water becomes a renewable resource. What are the effects of over exploitation of water resources?	CO2	T1	6-1-2022	18-1-2022
5	What is the flora and fauna found in Indo-Burma, Western Ghats and Eastern Himalayas regions of India?	CO3	T1	6-1-2022	18-1-2022
6	What is meant by biodiversity conservation? Explain the role of zoos and botanical gardens in biodiversity conservation.	CO3	T1	6-1-2022	18-1-2022

7	What are primary and secondary air pollutants? Enumerate various methods to control air pollution.	CO4	T1	6-1-2022	18-1-2022
8	Enumerate with examples the major sources of surface water pollution and ground water pollution. Explain the methods to control water pollution.	CO4	T1	6-1-2022	18-1-2022
9	Discuss the salient features of Air (Prevention and Control of Pollution) Act, 1981.	CO5	T1	6-1-2022	18-1-2022
10	What are the strategies for making cities and communities sustainable?	CO6	T1	6-1-2022	18-1-2022

SELF STUDY TOPICS

S.NO	Topics	Books and Journals	Course Outcomes
1	Dams: Benefits and problems	Environmental Studies by R. Rajagopalan	CO 2
2	Strategies for risk assessment, Concepts of Environmental Management Plan (EMP)	Environmental Studies by R. Rajagopalan	CO 5
3	Ozone depletion and Ozone depleting substances (ODS).	Environmental Studies by R. Rajagopalan	CO 4

	SRI INDU COLLEGE OF ENGG & TECH (Regulation :R20) Department of Electronics &Communication Engineering	Prepared on 23/10/2021 Rev1: Page: 17 of 23
Sub. Code & Title		**ENVIRONMENTAL SCIENCE (R20HAS1102)**
Academic Year: 2021-22	**Year/Sem./Section**	**Academic Year: 2021-22**
Faculty Name & Designation		**E.JYOTHI ASSISTANT PROFFESOR.**

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL BTL)

(1. Remembering 2.Understanding 3. Applying 4. Analyzing 5. Evaluating 6. Creating)

UNIT- I : Ecosystems		
1 MARK QUESTIONS	**BT Level**	**Course Outcome**
1 Define ecosystem. How does an ecosystem work?	1	CO1
2 What are biotic and abiotic factors?	1	CO1
3 Explain briefly the importance of ecological pyramids.	2	CO1
4 What are producers, consumers and decomposers in an ecosystem?	1	CO1
5 Discuss pyramid of biomass.	1	CO1
6 What is meant by biomagnification?	1	CO1
7 Explain the energy flow of an ecosystem.	1	CO1
8 Discuss pyramid of energy.	1	CO1
9 What is the nature of an ecosystem? Give its structure and functions.	2	CO1
10 List the different tropic levels of ecosystem.	2	CO1
11 What kind of organisms do we find in aquatic life zones?	1	CO1
12 Define biogeochemical cycles. Explain their importance.	1	CO1
13 What are terrestrial and aquatic ecosystems?	1	CO1
14 Relate ecosystem and biosphere?	1	CO1
15 What are the processes that autotrophic organisms use to produce organic material from inorganic substances?	2	CO1
16 Classify ecosystems based on their habitat, creation and exchange of matter and energy	1	CO1
17 Discuss pyramid of number.	2	CO1
10 MARK QUESTIONS	**BT Level**	**Course Outcome**
1 Explain energy flow pattern in different types of ecosystem. What happens to the energy flow as we move up the tropical levels?	1	CO1
2 List the main components of ecosystem and briefly describe the functions of ach.	1	CO1
3 Explain about carbon and nitrogen cycles with the help of a diagram.	2	CO1

4	Discuss the significance of food chains and food webs with relevant examples.	2	CO1
5	What are biogeochemical cycles? Explain phosphorous cycle with the help of a diagram.	2	CO1
6	Name all the cycles that constitute the proper functioning of an ecosystem.	2	CO1
7	Explain about the biomagnification property of a food chain.	5	CO1
8	What are ecological pyramids? Explain why some of these pyramids are upright while others are inverted in different ecosystem.	2	CO1
9	Differentiate between grazing food chain and detritus food chain.	1	CO1
10	List the different tropic levels of ecosystem?	6	CO1
11	Explain the role of producers, consumers and decomposers in an ecosystem with practical example.	5	CO1
12	What services do ecosystems provide us?	4	CO1
13	Differentiate among species, population and community.	3	CO1
14	List the different tropic levels of ecosystem?	3	CO1
15	What is the role of an individual to conserve the environment?	2	CO1
16	Explain about the bio magnification property of a food chain.	2	CO1

UNIT-II : Natural Resources: Classification of Resources			
1 MARKS QUESTIONS		**BT Level**	**Course Outcome**
1.	What are renewable and non-renewable resources? Give examples.	1	CO2
2.	Enlist different surface and ground water resources.	1	CO2
3	What are the environmental and social impacts of mining?	1	CO2
4	What is an aquifer? Discuss its types.	1	CO2
5	List the environmental effects of using of mineral resources.	2	CO2
6	Define mineral. Write its uses.	1	CO2
7	What is the importance of rain water harvesting?	1	CO2
8	What are the benefits and problems provided by large dams?	4	CO2
9	Define solar cells. Write its applications.	1	CO2
10	What is the impact of deforestation on the environment?	1	CO2
11	State any two reasons that why should we conserve natural resources.	1	CO2
12	Discuss the problems of over exploitation of ground water.	2	CO2
13	What exactly are fossil fuels and why are they non-renewable?	1	CO2
14	Define soil erosion. How can it be checked?	3	CO2
10 MARK QUESTIONS		**BT Level**	**Course Outcome**
1	Classify natural resources. What are the different methods of conserving water resource?	2	CO2
2	Explain how water becomes a renewable resource. What are the effects of over exploitation of water resources?	2	CO2
3	Discuss briefly droughts and floods with respect to their occurrence and impacts.	2	CO2

4	What are the advantages and disadvantages of dams to the society and environment?	2	CO2
5	Discuss in detail the major environmental and social impacts of mineral extraction.	2	CO2
6	Explain how serious are water logging and soil salinity in land degradation?	3	CO2
6	List out alternate energy sources. Explain their present status, merits and demerits.	1	CO2
7	What is a wind farm? Enumerate advantages and disadvantages associated with wind power.	3	CO2
8	Compare the advantages and disadvantages of oil, coal and natural gas as energy sources.	2	CO2
9	What are the advantages of hydropower? How energy is generated in hydroelectric power plant.	3	CO2
10	Explain the cause of over exploitation of natural resources. Why do we need to manage our resources?	3	CO2
11	What are the major anthropogenic causes of droughts and floods? Give its remedial measures.	3	CO2
12	Explain how solar energy converted to electrical power and what are the problems in this regard?	2	CO2
13	What is the impact of urbanization and industrialization on land?	3	CO2
14	Write a note on non-renewable energy resources. Explain how almost every source of energy has its limits.	2	CO2
15	Explain breezily about geo thermal energy and give its advantages and disadvantages?	1	CO2
16	What are renewable and non renewable energy sources and give the advantages of renewable energy sources?	3	CO2
17	What are the advantages of solar energy? Explain the role of solar energy in replacing natural energy sources.	1	CO2
18	What is the impact of urbanization and industrialization on land?	3	CO2

UNIT- III : Biodiversity And Biotic Resources

1 MARK QUESTIONS		**BT Level**	**Course Outcome**
1	Differentiate between genetic and species diversity	1	CO3
2	Define biodiversity. How biodiversity is measured?	1	CO3
3	What are the uses of biodiversity?	2	CO3
4	Define biodiversity hotspot. Where are biodiversity hotspots located?	1	CO3
5	What are the main causes of loss of biological diversity nowadays?	1	CO3
6	Summarize India as a mega diversity nation.	1	CO3
7	Describe how can human activities have an effect on biodiversity.	1	CO4
8	Define national park. Name few such parks in India.	1	CO4
9	Outline in situ and ex situ conservation of biodiversity.	2	CO4
10	List the indirect values of biodiversity.	1	CO4
11	What is the value of biodiversity?	1	CO4
12	Define the term genetic banks.	1	CO4
13	What is habitat fragmentation?	1	CO4
10 MARK QUESTIONS		**BT Level**	**Course Outcome**

1	Define biodiversity. Explain genetic diversity, species diversity and ecosystem diversity.	1	CO3
2	Summarize consumptive use value, productive use value, social value, ethical value, aesthetic value and optional value of biodiversity.	1	CO3
3	Explain how the study of biodiversity is beneficial to human life?	2	CO3
4	Our India is a "mega diversity nation" Support the statement highlighting the biodiversity greatness of India.	1	CO3
5	Explain hot spots of biodiversity and mention three hot spots found in India. Discuss their salient features.	1	CO3/CO4
6	What is the link between biodiversity and ecosystem services?	2	CO3,CO4
7	What is the flora and fauna found in Indo-Burma, Western Ghats and Eastern Himalayas regions of India?	1	CO3,CO4
8	What is meant by biodiversity conservation? Explain the role of zoos and botanical gardens in biodiversity conservation.	1	CO3,CO4
9	Enumerate five important biosphere reserves, national parks and wildlife sanctuaries of India. Also mention the state where they are located.	4	CO4
10	What are the major causes of human-wild life conflicts? Suggest suitable wild life conservation practices.	1	CO4
11	Explain in-situ and ex-situ conservation of biodiversity with examples.	4	CO4
12	Explain major threats to biodiversity.	2	CO4
13	What is the role of biotechnology with reference to biodiversity conservation?	6	CO4
14	What factors lead to biodiversity loss? Explain the human impact on biological diversity.	2	CO4
15	Describe actions can be taken to conserve biodiversity. How do protected areas benefit biodiversity and human?	2	CO4
16	What is the flora and fauna found in Western Ghats and Eastern Himalayas regions of India?	4	CO4
17	List the any three of wild life conservation sites in india and explain the role of conservation on wild life?	2	CO4
18	Explain in-situ and ex-situ conservation of biodiversity with examples.	4	CO4

UNIT- IV : Environmental Pollution and Control Technologies			
1 MARK QUESTIONS	**BT Level**	**Course Outcome**
1	Define pollution. Name various atmospheric pollutants.	1	CO4
2	What is noise pollution? Mention its sources.	2	CO4
3	What are the natural and man-made pollutants that cause air pollution?	1	CO4
4	Mention various methods to control air pollution in industries.	1	CO4
5	Discuss soil pollution caused by fertilizers.	1	CO4
6	Discuss the adverse health effects due to industrial noise.	1	CO4
7	Explain how ground water get pollutes.	3	CO4
8	Define air pollution. What are the sources of air pollution?	1	CO4
9	Define solid waste. How can solid waste be recycled?	1	CO4
10	Describe how we measure water quality.	1	CO4
11	Mention treatment methods used for industrial effluents.	1	CO4
12	Define e-waste. Why does it require management?	1	CO4
13	What is bioremediation?	1	CO4

14	What is ozone layer and why is it getting depleted?	1	CO4
15	What are the major causes of deforestation?	1	CO4
16	Outline the provisions of the Kyoto protocol.	1	CO4
17	What are ozone depleting substances?	1	CO4
18	What are the major causes of desertification?	1	CO4
19	Differentiate between climate change and global warming.	1	CO4
20	What are the results of implementation of the Montreal protocol?	1	CO4

	10 MARK QUESTIONS	**BT Level**	**Course Outcome**
1	What are primary and secondary air pollutants? Enumerate various methods to control air pollution.	1	CO4
2	Enumerate with examples the major sources of surface water pollution and ground water pollution. Explain the methods to control water pollution.	2	CO4
3	Describe the major sources of soil pollution. How does soil pollution affect soil productivity and what measures can be taken to prevent soil pollution?	1	CO4
4	Describe briefly the sources, effects and control of noise pollution.	3	CO4
5	Enumerate any five major categories of water pollutants, their sources and effects.	1	CO4
6	Discuss how e-waste can be managed to prevent environmental pollution	1	CO4
7	Describe the various ways of treating and purifying sewage water.	2	CO4
8	What adverse effects can solid wastes cause? Discuss how can the solid waste be managed.	1	CO4
9	Explain the concept of bioremediation. What are the advantages of bioremediation?	1	CO4
10	Explain climate change and global warming. How are they related and what is the evidence that proves climate is changing?	4	CO4
11	What are greenhouse gases? Discuss the potential and contribution of these gases to global warming phenomenon.	3	CO4
12	What are ozone depleting substances? Discuss the theme of Montreal protocol.	1	CO4
13	Describe briefly waste water treatment methods?	1	CO4

UNIT- V : Environmental Policy, Legislation & EIA			

	1 MARK QUESTIONS	**BT Level**	**Course Outcome**
1	List out the objectives of Air pollution act.	1	CO5
2	What are the objectives of wild life protection act?	1	CO5
3	Enlist various acts related to environment protection.	1	CO5
4	What is the role of green buildings in reducing global warming?	1	CO5
5	Write a note on bio-medical wastes.	1	CO5
6	What is meant by environmental impact assessment?	1	CO5
7	What is meant by crazy consumerism?	1	CO5
8	Enumerate the various effects of urban sprawl.	2	CO5
9	What is the importance of environmental education?	1	CO5
10	List any three categories of waste and give their sources.	1	CO5
11	What does the forest conservation act of 1980 specify?	4	CO5
12	Define hazardous waste. Are hazardous wastes dumped in India?	1	CO5
13	List out the objectives of Air pollution act.	5	CO5

		BT Level	Course Outcome
14	What are the objectives of wild life protection act?	1	CO5
15	Enlist various acts related to environment protection.	6	CO5
	10 MARK QUESTIONS	BT Level	Course Outcome
1	Discuss the salient features of Air (Prevention and Control of Pollution) Act, 1981.	1	CO5
2	What are the strategies for making cities and communities sustainable?	2	CO5
3	Discuss the salient features of Environmental protection Act, 1986.	1	CO5
4	List major provisions in Forest Conservation Act, 1980.	2	CO5
5	Discuss the salient features of Wild life protection Act.	1	CO5
6	What are the major municipal solid waste management and handling rules?	1	CO5
7	Define biomedical wastes. What are the rules to manage and handle them?	2	CO5
8	What are hazardous wastes? Discuss the rules to manage and handle them.	5	CO5
9	Define sustainable development. What are the threats and measures for sustainable development?	1	CO5
10	Describe the importance of environmental education. What is value-based environmental education?	2	CO5
11	Write the objectives, principles, key elements and importance of environmental impact assessment.	2	CO5
12	Discuss the major components of population growth. What are the advantages of having a healthy population?	5	CO5
13	Explain how can extreme consumerism among a society‟s wealthiest members affect middle-class people?	1	CO5
14	What is urban sprawl? Mention causes and effects of urban sprawl.	2	CO5
15	Explain the concept of green building. How will green building impact the environment overall.	2	CO5
16	Discuss the salient features of Water Act	5	CO5

BR-16   **SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY**   **D4**

(An Autonomous Institution Under 2(f) and 12(B) of UGC Act 1956, New Delhi)

II B.Tech - II Semester - I Mid Term Examinations

(R16HAS1102)   ENVIRONMENTAL STUDIES - (Common to CIVIL, ECE, CSE, IT)

Duration: 90Mins   **Date: 15.02.2019 AN**   **Max Marks: 25M**

Section – A

Answer _All_ the questions   **Marks: 5Qx1M = 5M**

1. Define Ecosystem and Ecology.

2. What are the biotic and a biotic component of an ecosystem?

3. Define Nuclear Fission and Nuclear fusion.

4. What are Solar Cells?

5. Explain genetic diversity.

Section – B

Answer any _FOUR_ questions   **Marks: 4Qx5M = 20M**

6. What are biogeochemical cycles? Explain carbon cycle with the help of a diagram.

7. What are ecological pyramids and Explain why some of these pyramids are upright while others are inverted in different ecosystems?

8. Explain about Water Resources.

9. Define land degradation. What are the major anthropogenic causes of landslides?

10. Define biodiversity. Explain different levels of biodiversity.

11. Write a note on values of biodiversity.

***

10.   Define biodiversity. Explain different levels of biodiversity.

11.   Write a note on values of biodiversity.

<div align="center">***</div>

BR-16   **SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY**   **D4**

<div align="center">(An Autonomous Institution Under 2(f) and 12(B) of UGC Act 1956, New Delhi)</div>

<div align="center">**II B.Tech - II Semester - II Mid Term Examinations**</div>

<div align="center">**(R16HAS1102)   ENVIRONMENTAL STUDIES -** (Common to CIVIL, ECE, CSE, IT)</div>

Duration: 90Mins   **Date: 16.04.2019 AN**   **Max Marks: 25M**

<div align="center">**Section – A**</div>

Answer _All_ the questions   **Marks: 5Qx1M = 5M**

1.   What are the major threats to biodiversity?

2.   Give the examples to primary and secondary pollutants causing air pollution.

3.   Give reasons for deforestation.

4.   Define the term "Segregation".

5.   Define sustainable development.

<div align="center">**Section – B**</div>

Answer any _FOUR_ questions   **Marks: 4Qx5M = 20M**

6.   Write a note on in-situ and ex-situ conservation of biodiversity with suitable examples.

7.   What do you mean by extinct, endangered, vulnerable and rare species? Name some endangered species of plants and animals of our country.

8.   Discuss adverse effects and controlling methods of water pollution.

9.   Discuss waste water treatment methods.

10.   Write a note on   a) EMP (Environment Management Plan).
                          b) EIA (Environmental Impact Assessment).

11.   What is the importance of Environmental Education? What is value based Environmental Education?

<div align="center">***</div>

Subject Code: Rl6HAS1102

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Dqlhi)
Rocognlzcd under 2(f) and 12(B) ofUGC Act 1956
II B.Tech - II Semester - End **Examinations** (Regular/Suppl.) May - 2019
ENVIRONMENTAL STUDIES
(Common to CIVH.,, ECE, CSE, IT)

Puradogi 3Bn   os.os,2012   Max Marks: 70M
Section-A

Answer &J.the followin& questions   **Marki:** 5Qx4M =20M

I. Define Biogcochomical cycle.

2. Write the differences between renewable and non ewable energy reso

3 Write the values ofBiodiversity.   .J

4. Write the characteristics of e-waste.

.5   What isenvironmental education?

Sectlon-B

Answer any _FIVE_ questions choosing at least onQ   · u nit

UNI –   **Marks: SQxlOM = 50M**

6. Define Ecosystem. Explain the structure an   ·   Ecosystem.

7. B ri fly explain the concept **ofBiog o** eBio accumulation and Biomagnification
with suitable example.

-ll

.8 · .:.:..:.".""'81re,o   o ::   ov..- utiliz,tion of swfuoe and ground wato,

.9 E xplam the effects of ov;r e o tion of mineral resourcs.e

UNIT-ID

10. Explain the strategier e for conservation of Biodiversity.
(OR)
11. India as a mega d diversity nation" comment on it.

UNIT - IV

2. What is soil pollution? Explain the impacts of modern agriculture