Hall Ticket Number :										

R-20

Code: 20A312T-C

I B.Tech. I Semester Regular & Supplementary Examinations April/May 2022

Engineering Drawing

(Common to CE & ECE)

Max. Marks: 70 Time: 3 Hours

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Answer any five questions by choosing one question from each unit (5 x 14 = 70 Marks)

		Marks	CO	Blooms Level
	UNIT–I			
1.	The foci of an ellipse are 90 apart, the minor axis is 65 mm long. Determine the length of major axis and draw the ellipse by oblong method.	14M	CO1	L1,L2
	OR			
2.	Draw an epi-cycloid of rolling circle 40 mm diameter which rolls outside another circle of 120 mm diameter for one complete revolution. Draw a tangent and normal to the curve at a point on it after the rolling circle has made one full revolution.	14M	CO1	L1,L2
	UNIT–II			
3	Two points A and B are in the H.P. The point A is 30mm infront of the V.P, while B is behind the V.P. The distance between their projectors is 75 mm and the line joining their top views makes an angle of 45^0 with xy. Find the distance of the point B, from the V.P.	14M	CO2	L1,L2
	OR			
4.	A line AB 75 mm long is inclined at 45^0 to the H.P and 30^0 to the V.P. Its end 'A' is 20 mm above the H.P and 40 mm infront of the V.P. Draw its projections.	14M	CO2	L1,L2
	UNIT–III			
5.	Draw the projections of a regular hexagon of 25mm side, having one of its sides in the H.P. and inclined at 60^0 to the V.P., and its surface making an angle of 45^0 with the H.P.	14M	CO3	L1,L2
	OR			
6.	ABC is a triangular lamina having the edges AB, BC and CA equal to 60,80 and 50 respectively. The edge AC rests on the HP and makes an angle of 45^0 with VP. The plane is inclined at 30^0 to HP. Draw its projections.	14M	CO3	L1,L2

UNIT–IV

7. A Pentagonal pyramid of base side 30mm and axis is 70mm long is lying on the H.P by one of the corner of its base such that its axis is 30^0 inclined to H.P and 45^0 inclined to V.P. Draw the projections of the pyramid. 14M CO4 L1,L2

OR

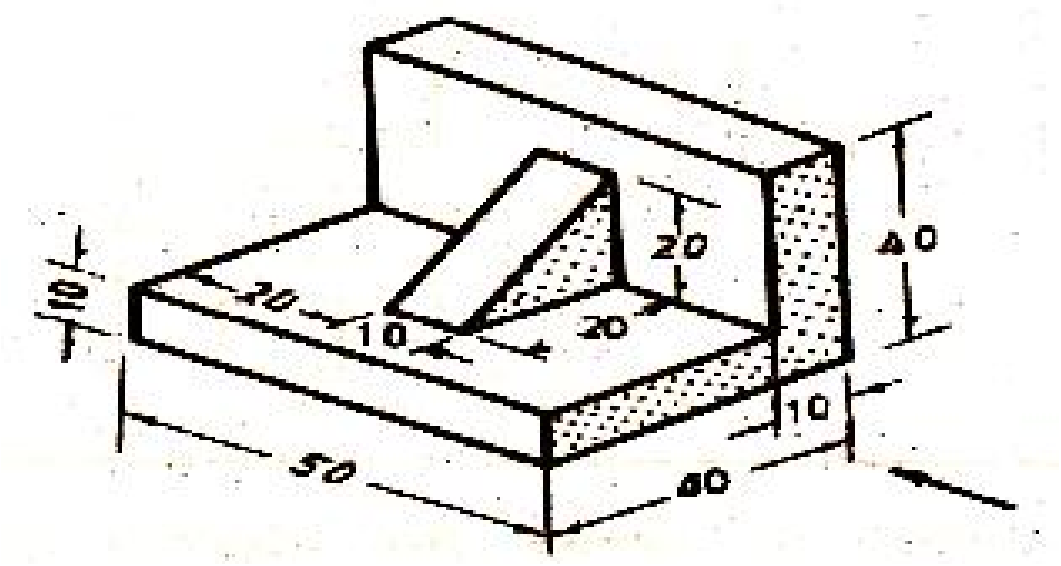
8. Draw the projections of a pentagonal prism base 25 mm side and axis 50 mm long, resting on one of its rectangular faces on the ground, with the axis inclined at 45^0 to the VP. 14M CO4 L1,L2

UNIT–V

9. A pentagonal pyramid of side of base 30mm and height 70mm is resting with its base on H.P. Draw the isometric drawing of the pyramid. 14M CO5 L1,L2

OR

10. Draw the FV, TV and LSV of the following Figure



14M CO5 L1,L2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A511T

I B.Tech. I Semester Regular & Supplementary Examinations April/May 2022

Problem Solving through C Programming

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

			CO	Blooms Level
1.	**Answer ALL the following short answer questions**	(5 X 2 = 10M)		
a)	What is the difference between a pseudo code and flow chart? Show both notations for adding two natural numbers.		1	L2
b)	What is the difference between while and do-while?		2	L2
c)	Write the syntax of strlen( ) and strcat( ) functions.		3	L1
d)	What is pointer and declare pointer array?		4	L1
e)	What is the difference between structure and union?		5	L1

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	Blooms Level
		UNIT–I			
2.	a)	What are the various steps to solve a problem? Explain them by taking an example.	6M	1	L2
	b)	Draw a flow chart to find the largest of three numbers in C.	6M	1,5	L2
		OR			
3.	a)	What are the various kinds of operators in C. Explain any four types with examples?	6M	1	L2
	b)	How can we classify different data types in C. Explain them.	6M	1	L2
		UNIT–II			
4.	a)	Explain selection sort algorithm with an example.	6M	2,5	L2
	b)	What is an Array? How to declare and initialize an Array. Explain with an example.	6M	2,5	L3
		OR			
5.	a)	Explain Binary Search Algorithm with an example.	6M	2,5	L2

	b)	You are given the height H (in metres) and mass M (in kilograms) of your friend. The Body Mass Index (BMI) of a person is computed as M/H^2. Report the category into which your friend falls, based on his BMI: Category 1: Underweight if BMI ≤18 Category 2: Normal weight if BMI ∈{19, 20,…, 24} Category 3: Overweight if BMI ∈{25, 26,…, 29} Category 4: Obesity if BMI ≥30	6M	2,5	L3

UNIT–III

6.	a)	What are the advantages of using Functions? How do we declare Functions in C.	6M	3	L2
	b)	Write a program to find the factorial of a given number using recursion.	6M	3,5	L3
		OR			
7.	a)	Explain various storage classes in C with an example.	6M	4	L2
	b)	What is the role of Preprocessor in the Compilation process and explain two preprocessor directives.	6M	4	L2

UNIT–IV

8.	a)	Define void pointer. Where we use this concept? Give an example for it.	6M	4	L2
	b)	Write a program to exchange two values using pointers.	6M	4	L3
		OR			
9.	a)	Distinguish between array of pointers and pointer to array with examples.	6M	4	L2
	b)	List the functions used in the dynamic memory allocation. Explain each function with an example.	6M	4	L2

UNIT–V

10.	a)	Describe about various file opening modes in C.	6M	4	L2
	b)	Write a program to compare two files, printing the first line where they differ.	6M	4,5	L3
		OR			
11.	a)	What are the different ways to access the members of structure elements in C. Give example for each case?	6M	4	L2
	b)	Write a C program to perform average of three number using files. Assume input numbers are existing in a file with name input.txt and result need to be saved in another file with the name output.txt	6M	4,5	L3

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC11T

I B.Tech. I Semester Regular & Supplementary Examinations April/May 2022

Algebra and Calculus

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	Blooms Level
1.	**Answer ALL the following short answer questions** (5X2= 10M)		
a)	Find the rank of $A=\begin{bmatrix}0 & 1 & 2\\ 1 & 2 & 3\\ 0 & 4 & -8\end{bmatrix}$	CO1	L3
b)	Define index and signature of a quadratic form.	CO2	L2
c)	Define total derivative in partial differentiation	CO3	L2
d)	Evaluate $\int_{x=0}^{1}\int_{y=0}^{2}\int_{z=0}^{2} x^2 yz\,dx\,dy\,dz$	CO4	L3
e)	Define beta function and explain two properties	CO5	L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	Blooms Level
	UNIT–I			
2. a)	Find the value of 'a' such that the system $2x+y+2z=0,\ x+y+3z=0,\ 4x+3y+{}^{a}z=0$ has non trivial solutions	6M	CO1	L3
b)	Find the Eigen values and Eigen vectors of the matrix $A=\begin{bmatrix}1 & 1 & 3\\ 1 & 5 & 1\\ 3 & 1 & 1\end{bmatrix}$	6M	CO1	L2
	OR			
3. a)	Reduce the matrix $\begin{bmatrix}1 & 3 & 4 & 3\\ 3 & 9 & 12 & 3\\ 1 & 3 & 4 & 1\end{bmatrix}$ to normal form and find its rank.	6M	CO1	L3

b) Find the Eigen values and the corresponding Eigen vectors of $A=\begin{bmatrix}3 & 1 & 4\\ 0 & 2 & 6\\ 0 & 0 & 5\end{bmatrix}$ — 6M CO1 L2

UNIT–II

4. Verify Cayley – Hamilton theorem for $A=\begin{bmatrix}2 & 1 & 1\\ 0 & 1 & 0\\ 1 & 1 & 2\end{bmatrix}$ and hence find A^{-1} and A^{6} — 12M CO2 L3

OR

5. Reduce the quadratic form $Q=6x_1^2+3x_2^2+3x_3^2-4x_1x_2-2x_2x_3+4x_3x_1$ into canonical form and find its nature. — 12M CO2 L3

UNIT–III

6. a) Expand the Taylor's series expansion of $Sinx$ in powers of $(x-\frac{®}{4})$ — 6M CO3 L3

b) If $U=f(2x-3y,3y-4z,4z-2x)$ then find the value of $\frac{1}{2}\frac{\partial U}{\partial x}+\frac{1}{3}\frac{\partial U}{\partial y}+\frac{1}{3}\frac{\partial U}{\partial z}$ — 6M CO3 L2

OR

7. a) If $x=r\,Sin^{-}\,Cos¤, y=r\,Sin^{-}\,Sin¤, z=r\,Cos^{-}$ then find $\frac{\partial(x,y,z)}{\partial(r,^{-},¤)}$ — 6M CO3 L3

b) A rectangular open box of capacity 32 cubic units is to be prepared. Find the dimensions of the box, to minimize the cost of painting outside. — 6M CO3 L2

UNIT–IV

8. a) Evaluate $\int\int\left(x^2+y^2\right)dx\,dy$ in the positive quadrant for which $x+y\le 1$ — 6M CO4 L3

b) Evaluate $\int_{y=1}^{e}\int_{x=1}^{\log y}\int_{z=1}^{e^x} \log z \; dz\, dx\, dy$ 6M CO4 L2

OR

9. Evaluate $\int_{0}^{4a}\int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dy\, dx$ by changing the order of the integration 12M CO4 L2

UNIT–V

10. a) Derive the relation between Beta and Gamma functions 6M CO5 L3

b) Evaluate $\int_{0}^{\infty} \sqrt{x}e^{-x^2} dx$ 6M CO5 L4

OR

11. a) Prove that $\Gamma\left(\frac{1}{2}\right) = \sqrt{®}$ 6M CO5 L3

b) Evaluate $\int_{0}^{\frac{®}{2}} \sqrt{\cot^{-}}\, d^{-}$ 6M CO5 L4

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC12T

I B.Tech. I Semester Regular & Supplementary Examinations April/May 2022

Applied Physics

(Common to EEE, ECE and AI&ML)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	Blooms Level
1.	**Answer ALL the following short answer questions** (5 X 2 = 10M)		
a)	Define double refraction in polarization. Give example.	CO1	L1
b)	List the types of polarization in dielectrics	CO2	L1
c)	State Poynting theorem of electromagnetic theory.	CO3	L1
d)	Mention the applications of Hall Effect in semiconductors.	CO4	L1
e)	Why magnetic flux expels from a superconductor in the superconducting state?	CO5	L3

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	Blooms Level
		UNIT–I			
2.	a)	Explain Newton's rings in interference of light.	4M	CO1	L2
	b)	Deduce an equation for wavelength of light from Newton's rings.	8M	CO1	L3
		OR			
3.	a)	Discuss Fraunhofer diffraction due to single slit experiment.	6M	CO1	L2
	b)	Obtain maxima and minima conditions for single slit experiment.	6M	CO1	L3
		UNIT–II			
4.	a)	Explain frequency dependance of polarization in dielectrics.	6M	CO2	L2
	b)	Write a short note on ferroelectricity?	6M	CO2	L1
		OR			
5.	a)	Define magnetic susceptibility and permeability.	4M	CO2	L1
	b)	Classify magnetic materials based on their properties.	8M	CO2	L4

UNIT–III

6.	a)	Discuss Stroke's theorem and prove it.	8M	CO3	L2
	b)	Write electromagnetic wave propagation Maxwell equations.	4M	CO3	L2

OR

7.	a)	Define acceptance angle and numerical aperture of a fibre.	4M	CO3	L1
	b)	Explain propagation of light through an optical fibre.	8M	CO3	L2

UNIT–IV

8.	a)	Classify solids based on energy bands.	6M	CO4	L4
	b)	Calculate density of majority charge carriers of p-type semiconductor.	6M	CO4	L3

OR

9.	a)	Define Hall Effect in semiconductors.	4M	CO4	L1
	b)	Derive an equation for Hall Coefficient.	8M	CO4	L3

UNIT–V

10.	a)	Discuss the properties of superconductors.	6M	CO5	L2
	b)	Explain Meissner's effect of superconductors.	6M	CO5	L2

OR

11.	a)	What is the basic significance of nanomaterials?	4M	CO5	L1
	b)	Explain the properties of nanomaterials.	8M	CO5	L2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A411T

I B.Tech. I Semester Regular & Supplementary Examinations April/May 2022

Basic Electrical and Electronics Engineering

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

		CO	Blooms Level
1.	**Answer ALL the following short answer questions** (5 X 2 = 10M)		
a)	What is capacitance?	1	L1
b)	State Maximum power transfer theorem?	2	L1
c)	What are the characteristics of Zener diode?	3	L1
d)	What is Π Filter?	4	L1
e)	Draw the symbol of n-p-n transistor?	5	L1

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	Blooms Level
	UNIT–I			
2. a)	Write short notes on current sources?	6M	1	L1,L2
b)	Explain any two types of potentiometer with neat diagram?	6M	1	L1,L2
	OR			
3. a)	Draw the block diagram of CRO?	6M	1	L1,L2
b)	What is DSO? and explain?	6M	1	L1,L2
	UNIT–II			
4. a)	State and explain the Ohm's Law?	6M	2	L1,L2
b)	Write short notes on source transformation?	6M	2	L1,L2
	OR			
5.	State and explain the super position theorem with suitable example?	12M	2	L1,L2
	UNIT–III			
6. a)	Derive the expression for transition capacitance in a PN junction diode?	6M	3	L1,L3
b)	Discuss the energy band Diagram of Semi conductors?	6M	3	L2

OR

7.	a)	Explain the static and dynamic Resistance of Diodes?	6M	3	L2
	b)	Write short notes on 'Temperature Dependency' of semi conductor diodes?	6M	3	L1,L2

UNIT–IV

8.		Draw and explain the operation of Half wave Rectifiers?	12M	4	L2

OR

9.		Explain the following i) RC filter ii) Capacitor filter	12M	4	L2

UNIT–V

10.		Discuss the Construction and operation of N-P-N transistor with neat sketches?	12M	5	L2

OR

11.		Explain the operation of CC configurations and their characteristics?	12M	5	L1,L2

*** End ***