Hall Ticket Number :										

R-20

Code: 20A211T

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

Basic Electrical Engineering

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

****

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

PART-A

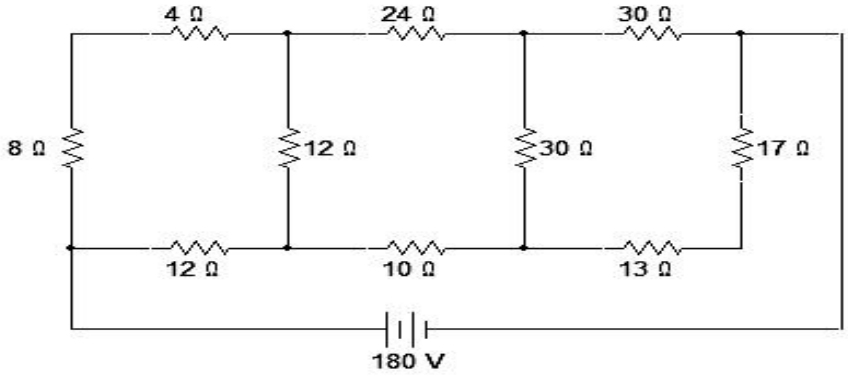
(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	Define i) Electric Current ii) Power	1	L1
b)	State Krichoff's Voltage Law.	2	L1
c)	State the different types of instruments.	3	L1
d)	Distinguish between Thermal power station and Hydro power station.	4	L2
e)	Sketch the VI Characteristics of PV Cell.	5	L3

PART-B

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

		Marks	CO	BL
	UNIT-I			
2. a)	Distinguish permanent magnets and electro magnets.	6M	1	L2
b)	State and explain Faradays laws of electromagnetic induction?	6M	1	L2
	OR			
3. a)	Define i) Fleming's right hand rule ii)Fleming's left hand rule iii) Lenz's law	6M	1	L1
b)	Given resistor R=10Ω and current passing through it is I=5A, Calculate: i) voltage across the resistor ii) power dissipated by the resistor.	6M	1	L2
	UNIT-II			
4.	Determine the current in 10Ω resistor in the network shown, use star-delta conversion			



12M 2 L3

OR

5.	a)	Derive the expression for star-to-delta transformation of a resistive network.	6M	2	L2
	b)	Define i) KCL ii) KVL iii) Ohms Law	6M	2	L2

UNIT-III

6.		Explain briefly methods used to measure Frequency and Phase.	12M	3	L2

OR

7.		Explain types of wires and cables	12M	3	L2

UNIT-IV

8.		With a neat layout diagram, explain the working of thermal power station.	12M	4	L2

OR

9.	a)	Explain about Nuclear fission?	6M	4	L2
	b)	Explain briefly operating principle of Thermal power station.	6M	4	L2

UNIT-V

10.		With a neat diagram, explain wind power generation plant.	12M	5	L3

OR

11.	a)	What is solar cell? Explain its principle of operation.	6M	5	L2
	b)	Discuss the horizontal axis wind turbines with applications.	6M	5	L2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A312T

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

Engineering Drawing

(Common to CE, EEE & ECE)

Max. Marks: 70 Time: 3 Hours

****

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

		Marks	CO	Blooms Level
	UNIT–I			
2.	P, Q and R are the centres of three circles of diameters 75mm, 45 mm and 30 mm respectively. PQ = 95 mm, QR=50 mm and PR = 75 mm. Draw a circle touching the three circles.	14M	CO1	L2
	OR			
3.	Q is a diameter of a circle and is 75 mm long. A piece of string is tied tightly round the circumference of the semi-circle starting from P and finishing at Q. The end Q is then untied and the string, always kept taut, is gradually unwound from the circle, until it lies along the tangent at P. Draw the curve traced by the moving extremity of the string.	14M	CO1	L2
	UNIT–II			
4.	A line PQ is 75 mm long and lies in an auxiliary inclined plane (A.LP.) which makes an angle of 45° with the H.P. The front view of the line measures 55 mm and the end P is in the V.P. and 20 mm above the H.P. Draw the projections of PQ and find (i) its inclinations with both the planes and (ii) its traces.	14M	CO2	L2
	OR			
5.	A line AB is in the first quadrant. Its end A and B are 20 mm and 60 mm in front of the V.P. respectively. The distance between the end projectors is 75 mm. The line is inclined at 30° to the H.P. and its H.T. is 10 mm above xy. Draw the projections of AB and determine its true length and the V.T.	14M	CO2	L2
	UNIT–III			
6.	Draw the projections of a circle of 50 mm diamete1~ having its plane vertical and inclined at 30° to the V.P. Its centre is 30mm above the H.P. and 20 mm in front of the V.P. Show also its traces.	14M	CO3	L2
	OR			
7.	A square ABCO of 50 mm side has its corner A in the H.P., its diagonal AC inclined at 30° to the H.P. and the diagonal BO inclined at 45° to the V.P. and parallel to the H.P. Draw its projections.	14M	CO3	L2

UNIT–IV

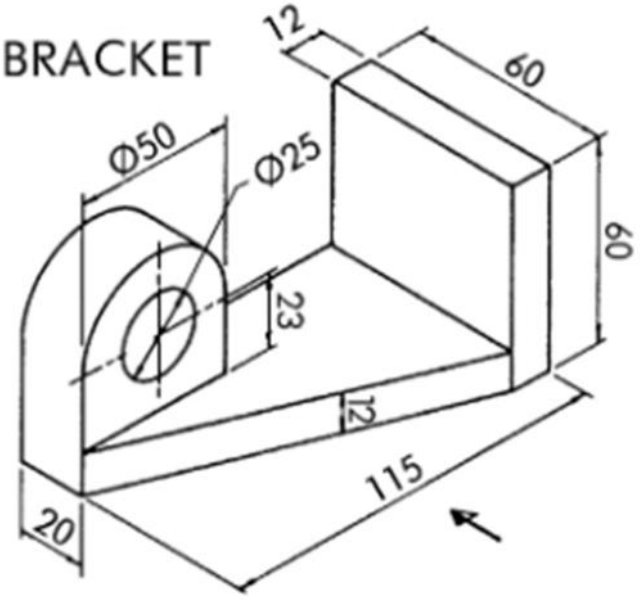
8. Draw the projections of a pentagonal prism, base 25 mm side and axis 50 mm long, resting on one of its rectangular faces on the H.P., with the axis inclined at 45^0 to the V.P. 14M CO4 L3

OR

9. A thin 30^0-60^0 set square has its longest edge in the VP and inclined at 30^0 to HP. Its surface makes an angle of 45^0 with the VP. Draw the projections. 14M CO4 L3

UNIT–V

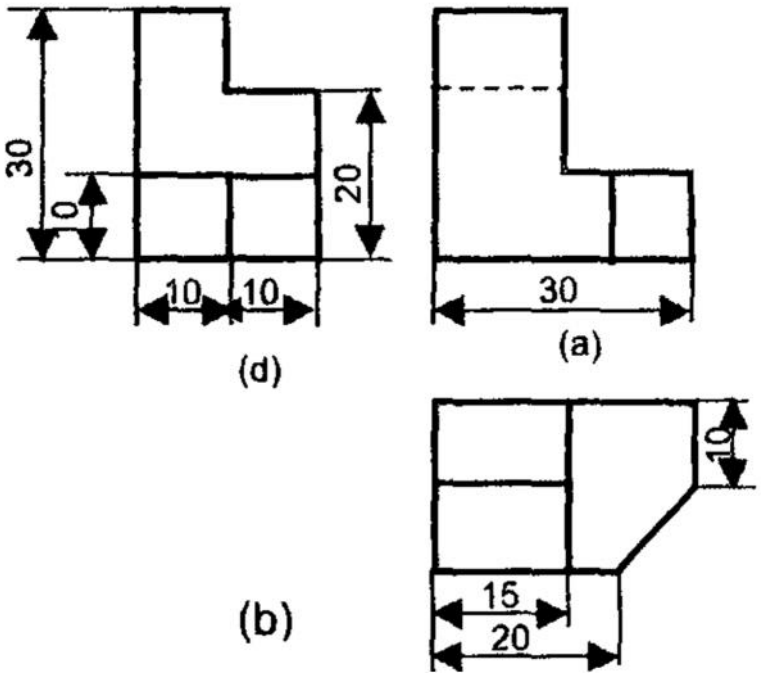
10. Draw the front view, top view and right side view for the following figure



14M CO5 L4

OR

11. Draw the isometric view for the following figure



14M CO5 L4

*** End ***

Hall Ticket Number :										

R-20

Code: 20A511T

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

Problem Solving through C Programming

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

****

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

PART-A

(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	What is the size of integer data type?	CO1	L1
b)	Differentiate do-while and while statements.	CO2	L2
c)	List the various storage classes in C.	CO3	L1
d)	What is a void pointer?	CO4	L1
e)	Give various modes of opening a file.	CO5	L1

PART-B

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

		Marks	CO	BL
	UNIT-I			
2. a)	What are the various steps to solve a problem? Explain them by taking an example.	6M	CO1	L1,L2
b)	Draw a flow chart to find the largest of three numbers in C.	6M	CO1	L3
	OR			
3. a)	Explain the Structure of C program.	6M	CO1	L2,L3
b)	How many keywords does C Language support? Explain.	6M	CO1	L1,L2
	UNIT-II			
4. a)	Explain Nested if else statements with an example.	6M	CO2	L2
b)	Write a C program to find the smallest number among three numbers.	6M	CO2	L1,L3
	OR			
5. a)	Describe about two dimensional arrays, initializing the two dimensional arrays and accessing elements in such arrays.	6M	CO2	L2
b)	Write a program to find an element present in a given array by using any one search technique.	6M	CO2	L1,L3

UNIT-III

6.		Explain briefly about string handling functions in C with examples.	12M	CO3	L2

OR

7.	a)	Differentiate call by value and call by reference with example	6M	CO3	L1,L3
	b)	Illustrate the concept of recursion.	6M	CO3	L2

UNIT-IV

8.	a)	Define a pointer. How to initialize and declare pointer variables? Explain the same with examples	6M	CO4	L1,L2
	b)	Explain how to pass one dimensional arrays to functions	6M	CO4	L2

OR

9.	a)	Write advantages and disadvantages of pointers	6M	CO4	L1,L3
	b)	Write a C program to find the greatest and smallest element in an array using pointers.	6M	CO4	L1,L3

UNIT-V

10.	a)	Differentiate between structures and unions, and write the syntax for nested structures	6M	CO5	L1,L2
	b)	What is an enumerated data type? Explain with example.	6M	CO5	L1,L2

OR

11.	a)	Explain the syntax for Nested structures. Describe Nested structures with an example.	6M	CO5	L2
	b)	Write a C program to reverse the contents of a file	6M	CO5	L1,L2

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC11T

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

Algebra and Calculus

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

****

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

PART-A

(Compulsory question)

1. Answer ***all*** the following short answer questions (5 X 2 = 10M) CO BL

a) Define the rank of the Matrix CO1 L1

b) Define index and signature of a Quadratic form CO2 L1

c) If $x = r\cos\theta, y = r\sin\theta$ then find $\frac{\partial(x,y)}{\partial(r,\theta)}$ CO3 L3

d) Evaluate $\int_0^1 \int_0^2 \int_0^2 xy^2z \, dz \, dy \, dx$ CO4 L5

e) Define Gamma function CO5 L1

PART-B

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

Marks CO BL

UNIT-I

2. a) Reduce the matrix to Echelon form and find its rank

$$\begin{bmatrix} -1 & -3 & 3 & -1 \\ 1 & 1 & -1 & 0 \\ 2 & -5 & 2 & -3 \\ -1 & 1 & 0 & 1 \end{bmatrix}$$ 6M CO1 L3

b) Investigate the values of λ and μ so that the equations $2x+3y+5z=9$, $7x+3y-2z=8$, $2x+3y+\lambda z=\mu$, have (i) no solution, (ii) a unique solution and (iii) an infinite number of solutions. 6M CO1 L3

OR

3. Find for what value of λ the equations $x+y+z=1$, $x+2y+4z=\lambda$, $x+4y+10z=\lambda^2$ have a solution and solve them completely in each case. 12M CO1 L3

UNIT-II

4. State and verify Cayley-Hamilton theorem for the matrix $A=\begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ and hence find A^4. 12M CO2 L2

OR

5. If $A = \begin{bmatrix} 3 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ then find the matrix P (model matrix) which transforms the matrix A to a Diagonal matrix. 12M CO2 L3

UNIT-III

6. a) Using Maclaurin's series, expand $\log(1+x)$ in powers of x. 6M CO3 L3

b) Find the minimum value of $x^2+y^2+z^2$ given $x+y+z=3a$ 6M CO3 L3

OR

7. a) If $x+y+z=u, y+z=uv, z=uvw$, then evaluate $\frac{\partial(x,y,z)}{\partial(u,v,w)}$ 6M CO3 L5

b) If $x+y+z=u, y$ Find the maximum value of $x^m y^n z^p u^r$ under the condition that $x+y+z=a$ 6M CO3 L3

UNIT-IV

8. Evaluate the integral by changing the order of integration $\int_0^{4a}\int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dy\,dx$ 12M CO4 L5

OR

9. Evaluate $\int_0^{c}\int_0^{}\int_0^{x+y} e^{x+y+z}\,dz\,dy\,dx$ 12M CO4 L5

UNIT-V

10. a) Show that $\Gamma\left(\frac{1}{2}\right)=\sqrt{\pi}$ 6M CO5 L2

b) Evaluate $\int_0^{1} x^{\frac{3}{2}}(1-x^2)^{\frac{5}{2}}dx$ 6M CO5 L5

OR

11. a) State and prove relation between Beta and Gamma functions 6M CO5 L2

b) Evaluate $\int_0^{\infty} \frac{x^2}{\sqrt{1-x^5}}dx$ in terms of Beta function 6M CO5 L5

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC12T

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

Applied Physics

(Common to EEE, ECE and AI&ML)

Max. Marks: 70 Time: 3 Hours

****

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

PART-A

(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	State Principle of Superposition theorem	CO1	L2
b)	What is dielectric constant and susceptibility	CO2	L1
c)	What is optical fiber	CO3	L1
d)	What is semiconductor and give examples	CO4	L1
e)	Write any two properties of superconductors	CO5	L1

PART-B

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

			Marks	CO	BL
		UNIT-I			
2.		Describe the single slit Fraunhofer diffraction and its intensity	12M	CO1	L2
		OR			
3.	a)	What is polarization and mention types	4M	CO1	L1
	b)	Describe the construction and working of Nicol prism	8M	CO1	L2
		UNIT-II			
4.	a)	What is electric dipole moment and write expression	3M	CO2	L1
	b)	Deduce the ionic polarizability of dielectric	9M	CO2	L4
		OR			
5.	a)	Define magnetic dipole moment	2M	CO2	L1
	b)	Derive dipole moments of magnetic material	10M	CO2	L3
		UNIT-III			
6.		Deduce the expression for acceptance angle and numerical aperture	12M	CO3	L4
		OR			
7.	a)	Explain the construction of optical fiber	4M	CO3	L2
	b)	Describe the optical fiber communication system	8M	CO3	L2
		UNIT-IV			
8.		State Hall effect and derive Hall co-efficient	12M	CO4	L3
		OR			
9.	a)	Explain intrinsic semiconductor	6M	CO4	L2
	b)	Derive Fermi energy in intrinsic semiconductor	6M	CO4	L3
		UNIT-V			
10.	a)	What is superconductor	2M	CO5	L1
	b)	Explain Josephson effect and V-I characteristics	10M	CO5	L2
		OR			
11.	a)	Explain basic principles of nanomaterials	6M	CO5	L2
	b)	Narrate the ball milling synthesis of nanomaterials	6M	CO5	L3

*** End ***