Hall Ticket Number :

Code: 20A411T

I B.Tech. I Semester Supplementary Examinations July 2023
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 marks.**
    3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

		Marks	CO	BL
1.	Answer ALL the following short answer questions (5 X 2 = 10M)		CO	BL
a)	Define Inductance and write the expression of energy stored in that.		1	L1
b)	Write the Statement of Thevenin's Theorem.		2	L1
c)	What is the Zero bias condition in the P-N Junction diode?		3	L1
d)	Define Form factor.		4	L1
e)	Sketch the symbols of n-p-n and p-n-p transistors.		5	L4

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

|			Marks	CO	BL

UNIT–I

			Marks	CO	BL
2.	a)	What are the three essential Elements in circuit analysis and explain about each of element with their v and i relationships.	6M	1	L1, L2
	b)	Describe the construction and operation of CRO with neat diagram.	6M	1	L2

OR

			Marks	CO	BL
3.	a)	Define and give the symbols of the following i) Dependent Sources ii) Independent Sources	6M	1	L1
	b)	Define Capacitance and derive the Energy stored in the Capacitor.	6M	1	L1

UNIT–II

4. a) Find 'R' in the circuit shown in below if the Req = 50 ohms.
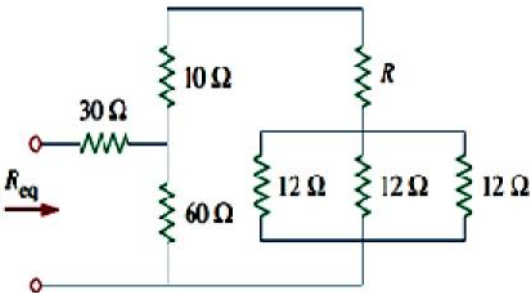
6M   2   L3

b) A parallel Resonant circuit has R= 5K , L=8mH, and C=60μF. Determine: i) Resonant frequency ii) The band width iii) The Quality Factor   6M   2   L3
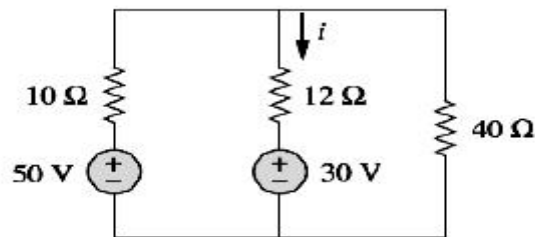
OR

5. a) State and Explain
   i) Ohms law ii) Kirchhoff's current law iii) Kirchhoff's voltage law   6M   2   L1, L2

b) Solve for 'i' using Norton's Theorem in the circuit shown in figure

6M   2   L3

UNIT–III

6. a) Briefly explain the zener breakdown and avalanche breakdown mechanisms in a PN junction diode.   6M   3   L3

b) Derive the expression for transition capacitance in a PN junction diode.   6M   3   L6

OR

7. a) Define diffusion capacitance in a P-N junction diode and discuss its dependence on diode biasing.   6M   3   L1

b) Obtain different equivalent Circuits of a PN Junction diode.   6M   3   L2

UNIT–IV

8. a) Draw the circuits of a full wave rectifier using 2-diodes and 4-diodes. Discuss the relative merits and demerits.   6M   4   L1, L2

b) Explain the operation of Half wave Rectifier with the help of neat diagrams.   6M   4   L2

OR

9. a) Derive expressions for ripple factor and efficiency of rectification for a full wave rectifier.   8M   4   L6

b) Compare C, L, L-Section, -Section (CLC and CRC) Filters in all respects.   4M   4   L4

UNIT–V

10. Illustrate the input and output characteristics of BJT in three configurations.   12M   5   L3

11. Compare BJT and JFET devices in all respects.   6M   5   L4

a) What is early effect? Explain how it affects the BJT Characteristics in CB Configuration.   6M   5   L1, L2

*** End ***

Code: 20A312T

I B.Tech. I Semester Supplementary Examinations July 2023
Engineering Drawing
(Common to CE, EEE and ECE)

Max. Marks: 70   Time: 3 Hours
Answer *five full* questions by choosing one question from each unit (5 x 14 = 70 Marks)
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Marks

UNIT–I

1. Construct a parabola when the distance between the focus and directrix is 50mm. Also draw the tangent and normal to any point on the curve.   14M

OR

2. Construct an epicycloid of a circle 60 mm diameter which rolls outside of another circle of 120 mm diameter for one revolution. Draw tangent and normal to any point on the curve.   14M

UNIT–II

3. A line NS, 80mm long has its end N, 10mm above the HP and 15mm in front of the VP. The other end S is 65mm above the HP and 50mm in front of the VP. Draw the projections of the line and find its true inclinations with the HP and VP.   14M

OR

4. Draw the projections of the following points on the same ground line, keeping the projections 30mm apart.
   - i.   A, in the H.P & 30mm, behind the V.P
   - ii.   B, 30mm above the H.P & 15mm in front of the V.P.
   - iii. C, in the V.P & 50mm above the H.P.
   - iv.   D, 30mm below the H.P & 35mm behind the V.P.
   - v.   E, 25mm above the H.P & 65mm behind the V.P.
   - vi.   F, 45mm below the H.P & 35mm in front of the V.P.
   - vii. G, in both the H.P & the V.P.   14M

UNIT–III

5. A regular pentagon of 25mm side has one side on the ground. Its plane is inclined at 45^0 to the HP and perpendicular to the VP. Draw its projections   14M

OR

6. A semi-circular lamina of 64mm diameter has its straight edge in VP and inclined at an angle of 45^0 to HP. The surface of the lamina makes an angle of 30^0 with VP. Draw the projections   14M

UNIT–IV

7. A hexagonal pyramid, base 25mm side and axis 50mm long, has an edge of its base on the ground. Its axis inclined 30° to the ground and parallel to the V.P. Draw its projections   14M

OR

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

UNIT–V

9. Draw the top view, front view and left side view for the object shown below.

14M
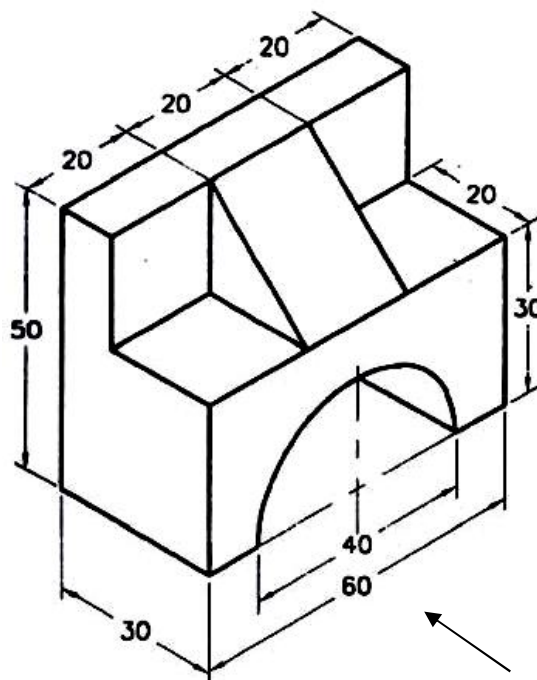
OR

10. Draw the isometric view of hexagonal prism, with side of base 25mm and axis 60mm long. The prism is resting on its base on HP, with an edge of the base parallel to VP.   14M

*** End ***

I B.Tech. I Semester Supplementary Examinations July 2023
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 marks.**
      3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

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

a) Summarize the basic Datatypes supported in C Programming.   CO1   L2

b) Differentiate break and continue statements.   CO2   L2

c) Interpret the declaration of a header file with < > and " ".   CO3   L2

d) Define Pointer.   CO4   L2

e) Differentiate text files and binary files.   CO5   L3

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

                                           Marks   CO   BL

UNIT–I

2.   Discuss the types of operators in C programming.   12M   1   L2

OR

3. a) Define a variable and list the rules for variable declaration.   6M   1   L2

    b) Differentiate global and local variables with examples.   6M   1   L2

UNIT–II

4. a) Model a C program to produce the Transpose of a given matrix.   6M   2   L3

    b) Apply selection sort on the following list of elements
       30, 60, 80, 10, 50, 90, 70, 20   6M   2   L3

OR

5. a) Discuss the conditional control statements in C programming.   6M   2   L3

    b) Model a C program for Linear search.   6M   2   L2

UNIT–III

6. a) Analyze the storage classes in C.   8M   3   L4
   b) Describe the built-in functions strcmp(), strcpy().   4M   3   L2

OR

7. a) Model a C program to find the GCD of two integers using functions.   6M   3   L5
   b) Describe actual and formal parameters in C programming.   6M   3   L2

UNIT–IV

8. a) Differentiate call by value and call by reference.   6M   4   L3
   b) Develop a C program using the predefined functions malloc, and realloc.   6M   4   L6

OR

9. a) Differentiate static and dynamic memory allocation.   4M   4   L2
   b) Apply bubble Sort over the list of integers using pointers   8M   4   L3

UNIT–V

10. a) Demonstrate the accessing members of a structure using variable.   6M   5   L3
    b) Describe the file opening modes of operation.   6M   5   L2

OR

11. a) Develop a c program to read and write data into a text file.   6M   5   L5
    b) Demonstrate the passing array of structures to functions.   6M   5   L4

END

I B.Tech. I Semester Supplementary Examinations July 2023
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)

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

		CO	BL
a)	The rank of the matrix $\begin{bmatrix} 1 & 1 & -1 \\ 2 & -3 & 4 \\ 3 & -2 & 3 \end{bmatrix}$ Is	1	3
b)	Using Cayley-Hamilton theorem , the value of $A^4 = , A^3 = , A^2 = A + 2I$ when $A = \begin{bmatrix} 1 & 2 \\ 4 & 2 \end{bmatrix}$ is	2	3
c)	Expand e^x by Maclaurin's series	3	2
d)	Evaluate $\int \int x^2 y^3 dx dy$ over the rectangle $0 \leq x \leq 1$ and $1 \leq y \leq 3$	4	3
e)	Find the value of $\Gamma(-1/2)$	5	3

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

	Marks	CO	BL

UNIT–I

		Marks	CO	BL
2. a)	Reduce the following matrix into Echelon form and hence find its rank. $\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$	6M	1	3
b)	Test for consistency and solve 4x-2y+6z = 8 x+y-3z = -1 15x-3y+9z = 21	6M	1	3

OR

		Marks	CO	BL
3.	Find the eigenvalues and eigenvectors of the matrix $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$	12M	2	3

UNIT–II

4. Find the characteristic equations of the matrix; $\begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$

And hence compute A^{-1}. Also find the matrix represented by

$A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I.$ 12M   2   3

OR

5. Find the matrix **P** which transforms the matrix

$\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$

To the diagonal form. Hence calculate A^4 12M   2   3

UNIT–III

6. a) Use Maclaurin's series, to prove that

$$\log(1 + \sin x) = x - \frac{x^2}{2} + \frac{x^3}{6} - \frac{x^4}{12} + \cdots\cdots$$ 6M   3   2

b) Discuss the maxima and minima of

$f(x, y) = x^3 y^2 (1 - x - y)$ 6M   3   2

OR

7. a) If $x = r \sin\theta \cos\phi, y = r\sin\theta\sin\phi, z = r\cos\theta$ then show that

$\frac{\partial(x,y,z)}{\partial(r,\theta,\phi)} = r^2 \sin\theta$ 6M   3   3

b) Find the volume of the greatest rectangular parallelepiped that

can be inscribed in the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$ 6M   3   3

UNIT–IV

8. Evaluate $\int\int r^3 dr d\theta$ over the area bounded between the circles

$r = 2\cos\theta$ & $r = 4\cos\theta$ 12M   4   3

OR

9. Evaluate $\int_{-1}^{1} \int_{0}^{z} \int_{x-z}^{x+z} (x + y + z)\, dx\, dy\, dz$ 12M   4   3

UNIT–V

10. Express the following integrals in terms of gamma function

(i) $\int_{0}^{1} \left(\frac{1}{\sqrt{1 - x^4}} \right) dx$ (ii) $\int_{0}^{\pi/2} \sqrt{\tan\theta}\, d\theta$ 12M   5   2

OR

11. Prove that $\int_{0}^{1} \left(\frac{x^2}{\sqrt{1-x^4}} \right) dx \times \int_{0}^{1} \left(\frac{1}{\sqrt{1+x^4}} \right) dx = \frac{\pi}{4\sqrt{2}}$ using

gamma and beta functions.   12M   5   3

*** End ***