Hall Ticket Number :

Code: 20A411T

I B.Tech. I Semester Supplementary Examinations June 2024
Basic Electrical & 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)

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

		CO	BL
a)	Define Inductance and write the expression of energy stored in that.	**CO1**	**L1**
b)	State Super position theorem?	**CO2**	**L1**
c)	What are the Types of Semiconductor diodes?	**CO3**	**L1**
d)	Define Form factor.	**CO4**	**L1**
e)	For common base configuration, = _____	**CO5**	**L2**

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)	Differentiate between Active and Passive elements.	6M	CO1	L2
	b)	What are the three essential Elements in circuit analysis and explain about each of element with their v and I relationships.	6M	CO1	L2

OR

			Marks	CO	BL
3.	a)	Explain the voltage sources?	6M	CO1	L1
	b)	What are the active and passive elements?	6M	CO1	L1

UNIT-II

			Marks	CO	BL
4.	a)	Write short notes on Norton's theorem?	6M	CO2	L4
	b)	Write short notes on source transformation?	6M	CO2	L4

OR

		Marks	CO	BL
5.	State and Explain i) Ohms law ii) Kirchhoff's current law iii) Kirchhoff's voltage law	12M	CO2	L2

UNIT-III

		Marks	CO	BL
6.	Explain the VI characteristics of PN Junction diode with neat diagrams and explain. What is Static Resistance and Dynamic Resistance?	12M	CO3	L2

OR

		Marks	CO	BL
7.	Discuss the Volt-Ampere characteristics of a P-N Diode under reverse-bias condition.	12M	CO3	L2

UNIT-IV

			Marks	CO	BL
8.	a)	Explain the operation of Half wave Rectifier with Capacitor filter.	6M	CO4	L2
	b)	Explain the operation of Full wave Rectifier with Capacitor filter.	6M	CO4	L2

OR

		Marks	CO	BL
9.	Explain the following i) Choke filter ii) - filter	12M	CO4	L2

UNIT-V

		Marks	CO	BL
10.	Outline the input-output characteristics of a transistor in CE configuration.	12M	CO5	L4

OR

		Marks	CO	BL
11.	Discuss briefly the Transistor operation in CE configurations and their characteristics?	12M	CO5	L2

*** End ***

Hall Ticket Number :

R-20

Code: 20A312T

I B.Tech. I Semester Supplementary Examinations June 2024
Engineering Drawing
(Common to CE, EEE & ECE)

Max. Marks: 70   Time: 3 Hours
Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)
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			Marks	CO	BL

UNIT–I

| 1. | a) | Divide a line of 100 mm into (i) 15 equal parts (ii) 7 equal parts. | 7M | 1 | 1 |
| | b) | Draw a pentagon of side 40 mm with one side vertical. | 7M | 1 | 1 |

OR

| 2. | | Construct a rectangular hyperbola, when a point P on it is at a distance of 18mm and 34mm from two asymptotes. Also draw a tangent to a curve at a point 20mm from an asymptote. | 14M | 1 | 1 |

UNIT–II

| 3. | a) | Draw the projections of a line BC,75mm long in the following positions Parallel and 30mm above HP and in the VP. | 7M | 2 | 1 |
| | b) | Inclined at 45^0 to the VP, in the HP and its one end in the VP | 7M | 2 | 1 |

OR

| 4. | | A line PQ, 70mm long is parallel to H.P and inclined at 30^0 to V.P. The end P is 25mm above H.P and 40mm in front of V.P. Draw the projections of the straight line. | 14M | 2 | 1 |

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 | 3 | 1 |

OR

| 6. | | A regular hexagonal plane of 35mm side has a corner at 20mm from V.P and 50mm from H.P. Its surface is inclined at 45^0 to V.P and perpendicular to H.P. Draw the projections of the plane. | 14M | 3 | 2 |

UNIT–IV

| 7. | | A cube of 40mm side, is resting with a face on HP such that when one of its vertical faces is inclined at 30^0 at VP. | 14M | 4 | 2 |

OR

| 8. | | A square pyramid, base 40mm side and axis 60mm long has a triangular face in the V.P. The front view of the axis making an angle of 60° with XY (the apex downwards). Draw its projections. | 14M | 4 | 2 |

UNIT–V

9.   Draw the Front view, Top view and side view for the following figure 1.

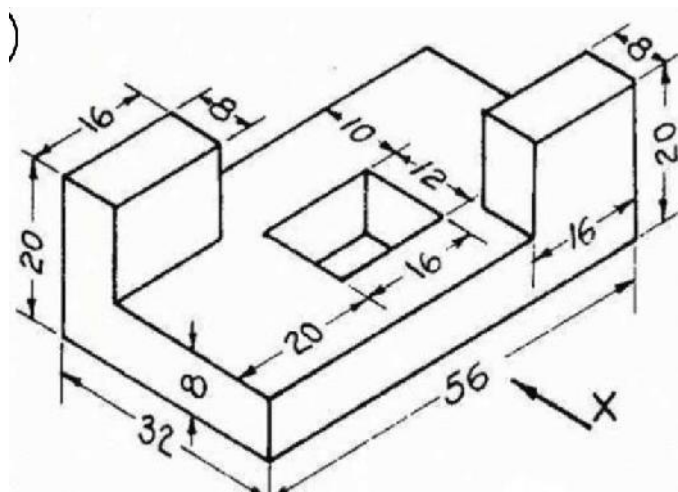Figure 1.   14M   5   1

OR

| 10. | | Draw the isometric view of a pentagonal pyramid of base side 30mm and height is 75mm, when its axis is perpendicular to H.P. | 14M | 5 | 1 |

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Code: 20A511T

R-20

I B.Tech. I Semester Supplementary Examinations June 2024
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 *all* the following short answer questions   (5 X 2 = 10M)

		CO	BL
a)	List the various steps that are involved in solving a problem	CO1	L1
b)	What are selection statements?	CO2	L1
c)	What is the difference between strlen() and sizeof the string?	CO3	L1
d)	What is pointer and how to declare and initialize pointer.	CO4	L1
e)	How do we identify the end of file in C. Illustrate with an example?	CO5	L1

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)	Briefly explain about the basic data types that C language supports.	6M	CO1	L2
b)	What is flow chart? How it is useful in writing the programs? Explain about different symbols in flow chart	6M	CO1	L2

OR

		Marks	CO	BL
3. a)	Illustrate the Relational Operators and Logical operators in C.	6M	CO1	L3
b)	Explain the operator precedence and Associativity with examples in C.	6M	CO1	L2

UNIT-II

		Marks	CO	BL
4. a)	In what way a do...while is different from while looping statement. Explain.	6M	CO2	L2
b)	Write a C program to find the factorial of a number using while loop.	6M	CO2	L3

OR

		Marks	CO	BL
5. a)	Sort the following list of elements using bubble sorting technique. -2,45,0,11,-9	6M	CO2	L4
b)	Briefly explain Binary Search algorithm.	6M	CO2	L2

UNIT-III

6. a) Write a C program to count the number of vowels and consonants, digits spaces and special characters in a line of string.   6M   CO3   L3

b) Illustrate the concept of Towers of Hanoi Problem. How recursion helps to solve this problem.   6M   CO3   L3

OR

7. a) Discuss the preprocessor directives.   6M   CO3   L2

b) Write a C program to find the LCM of two integers.   6M   CO3   L3

UNIT-IV

8. a) What is pointer arithmetic? Illustrate with an example   6M   CO4   L3

b) Write a c program to swap two integer variables using swap function.   6M   CO4   L3

OR

9. Explain in detail about Dynamic Memory Allocation functions with an examples in C programming.   12M   CO4   L2

UNIT-V

10. a) How to represent union in Structure? Explain with an example.   6M   CO5   L2

b) Illustrate file positioning functions in C with example.   6M   CO5   L3

OR

11. a) What are self-referential structures? Explain them with an example   6M   CO5   L2

b) Write a program to copy one file data into another file.   6M   CO5   L3

*** End ***

Code: 20AC11T

I B.Tech. I Semester Supplementary Examinations June 2024

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 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

                                                                               CO1 L1

a) If $A=\begin{bmatrix} 1 & 4 & 5 \\ 0 & 6 & 8 \\ 0 & 0 & 22 \end{bmatrix}$ then find the rank of A

b) State Cayley-Hamilton theorem.   CO2 L2

c) Obtain Maclaurin's series for $f(x) = \sin x$ L3 CO3

d) Write the area enclosed by a plane curve in xy-plane   CO4 L2

e) Define Beta 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.   Reduce the following matrix into its normal form and hence find its rank.

$$\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$$

                                                                    12M CO1 L1

OR

3. a) Show that a square matrix A and A^T have the same Eigen values   6M CO1 L2

   b) If } is Eigen value of an Orthogonal matrix, then show that is also its Eigen value.   6M CO1 L2

UNIT-II

4.   Reduce the quadratic form $2x_1x_2 + 2x_1x_3 - 2x_3x_2$ to canonical form by an orthogonal reduction and discuss its Nature. Also find the model matrix.   12M CO2 L3

OR

5. Show that the matrix $\begin{bmatrix} 1 & -2 & 2 \\ 1 & -2 & 3 \\ 0 & -1 & 2 \end{bmatrix}$ satisfies its

characteristic equation. Hence find A^{-1}. 12M CO2 L2

UNIT-III

6. a) Expand the Taylor's series expansion of $\sin x$ in powers of

$\left(x - \frac{\pi}{2}\right)$ 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 L3

OR

7. A rectangular box open at the top is to have volume of 32 cubic ft. find the dimensions of the box requiring least material for its construction. 12M CO3 L3

UNIT-IV

8. Evaluate the double integral $\iint_R xy \, dx \, dy$ where 'R' is the

region bounded by the lines $x - axis$, the line $y = 2x$ and

$y = \frac{x}{4a}$ 12M CO4 L5

OR

9. Evaluate the integral by changing the order of integration

$\int_0^a \int_{\frac{x^2}{a}}^{2a-x} xy^2 \, dy \, dx$ 12M CO4 L5

UNIT-V

10. a) Show that $\int_0^1 x^m (\log x)^n \, dx = \frac{(-1)^n n!}{(m+1)^{n+1}}$ where n is a

positive integer and m>-1 6M CO5 L2

b) Evaluate $\int_0^{\frac{\pi}{2}} \sin^{10} \theta \, d\theta$ 6M CO5 L5

OR

11. Express the following integrals in terms of gamma function

(i) $\int_0^1 \left(\frac{1}{\sqrt{1-x^4}}\right) dx$ (ii) $\int_0^{\frac{\pi}{2}} \sqrt{\tan \theta} \, d\theta$ 12M CO5 L2

*** End ***

Code: 20AC12T

I B.Tech. I Semester Supplementary Examinations June 2024
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 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 interference and mention types   CO1   L1
   b) Define dipole moment and write is equation   CO2   L1
   c) Define divergence of vector field with equation   CO3   L1
   d) State Hall effect   CO4   L2
   e) State Meissner' s effect.   CO5   L2

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

		Marks	CO	BL

UNIT-I

2.   What is diffraction and explain Fraunhofer diffraction due to double slit.   12M   CO1   L2

OR

3.   Describe the theory of Newton's ring experiment.   12M   CO1   L2

UNIT-II

4. a) Explain frequency dependence of polarizabiity.   6M   CO2   L2
   b) Deduce Clausius – Mossotti Relation.   6M   CO2   L4

OR

5.   Differentiate the dia, para, ferro, anti-ferro and ferrites.   12M   CO2   L3

UNIT-III

6. a) Explain divergence of vector field.   4M   CO3   L2
   b) State and prove Pointing theorem.   8M   CO3   L3

OR

7. a) Describe working of optical fiber with neat diagram.   4M   CO3   L2
   b) Explain optical fiber communication with block diagram.   8M   CO3   L2

UNIT-IV

8. a) Distinguish n-type and p-type semiconductors.   6M   CO4   L4
   b) Derive the conductivity of semiconductor.   6M   CO4   L3

OR

9.   Derive Hall voltage and write their applications.   12M   CO4   L3

UNIT-V

10. a) Discuss BCS theory of superconductivity.   8M   CO5   L2
    b) Write the applications of superconductors.   4M   CO5   L3

OR

11. a) Explain basic principles of nanomaterials   6M   CO5   L2
    b) How nanomaterials synthesis by chemical vapor deposition method   6M   CO5   L2

*** End ***