Hall Ticket Number : ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚

| R-19 |

Code: 19AC12T

I B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Applied Physics

(Common to 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	Blooms Level
		UNIT–I			
1.		Demonstrate the experimental procedure of Newton's ring method to determine radius of curvature of plano convex lens.	14M	1	L3
		OR			
2.	a)	Distinguish between the interference and diffraction.	4M	1	L4
	b)	Explain the experimental procedure to determine wavelength of light by using diffraction grating.	10M	1	L2
		UNIT–II			
3.	a)	Derive the equation of Clausius-Mosotti relation in dielectric materials.	6M	2	L2
	b)	Define ionic polarization and derive the equation for ionic polarizability.	8M	2	L2
		OR			
4.	a)	Define magnetic susceptibility and explain Weiss domain theory for ferromagnetic materials.	10M	2	L2
	b)	Calculate the relative permeability of a ferromagnetic material is a field of strength 220 A/m produces a magnetization 3300 A/m in it.	4M	2	L3
		UNIT–III			
5.		Derive the Mazwell's equations in both differential and integral form.	14M	3	L2
		OR			
6.	a)	Discuss the construction and working principle of optical fiber	4M	3	L3
	b)	Explain signal propagation in step index single mode and multimode optical fibers.	10M	3	L2
		UNIT–IV			
7.	a)	Describe energy band theory to classify solids	6M	4	L1
	b)	Explain intrinsic and extrinsic semiconductors.	8M	4	L2
		OR			
8.	a)	Discuss the various applications of semiconductors.	4M	4	L3
	b)	Explain intrinsic and extrinsic semiconductors.	10M	4	L2
		UNIT–V			
9.	a)	Describe the BCS theory of superconductivity.	8M	5	L3
	b)	Explain type-I and type-II superconductors.	6M	5	L2
		OR			
10.	a)	Write various applications of nanomaterials.	6M	5	L3
	b)	Explain synthesis of nanomaterials by chemical vapor deposition method.	8M	5	L2

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Code: 19A411T

R-19

I B.Tech. I Semester Supplementary Examinations December 2022
Essentials of Electrical & Electronics Engineering
(Common to 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. | What is potentiometer? Explain the types of Potentiometers with neat sketch. | 14M | 1 | 1 |

OR

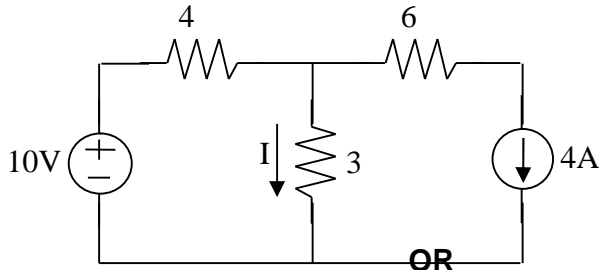| 2. | a) | What is Ohm's Law? What are its limitations? | 5M | 1 | 3 |
| | b) | Write voltage, current, power and energy relations for the circuit elements given below. | | | |
| | | i) Resistor   ii) Inductor   iii) Capacitor | 9M | 1 | 3 |

UNIT–II

3.	a)	State the following			
		i) Ohm's law ii) KVL iii) KCL	9M	2	2
	b)	Find the current 'I' using Kirchoffs Current Law (KCL)			

| | | | 5M | 2 | 3 |

OR

| 4. | State and explain Thevenin's and Norton's Theorem with simple Example each. | 14M | 2 | 2 |

UNIT–III

| 5. | a) | Draw and explain the characteristics of PN junction diode. | 8M | 3 | 2 |
| | b) | How a PN junction diode acts as a switch? Explain. | 6M | 3 | 3 |

OR

| 6. | a) | Draw and explain the characteristics of Zener diode. | 7M | 3 | 2 |
| | b) | Explain breakdown mechanism in Zener diode. | 7M | 3 | 2 |

UNIT–IV

| 7. | Design a Full-wave center-tap rectifier with capacitor filter and explain its operation. | 14M | 4 | 4 |

OR

| 8. | With neat waveforms explain the half wave Rectifier with Choke filter and also derive an expression for its ripple factor. | 14M | 4 | 2 |

UNIT–V

| 9. | Draw and explain the input and output characteristics of transistor in CE configuration. | 14M | 5 | 2 |

OR

| 10. | a) | Explain Base width modulation of CB Configuration. | 6M | 5 | 2 |
| | b) | The leakage currents of the transistor with usual notations are I_{CEO}=410µA; I_{CBO}=5µA.Calculate I_C. | 8M | 5 | 3 |

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I B.Tech. I Semester Supplementary Examinations December 2022
Problem Solving and C Programming
(Common to All Branches)

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

UNIT–I

1. a) What are identifiers? What are the rules for declaring identifiers? Give example.   8M
   b) What is constant? Describe its classification with example   6M

OR

2.   What is flowchart? Describe various symbols used in flowcharts and draw flowchart for reversing the digits of a given number.   14M

UNIT–II

3. a) Explain various iterative statements available in C language with examples.   8M
   b) Write a program to find out whether the given number is Armstrong or not?   6M

OR

4. a) What are the limitations of switch () case statement?   7M
   b) Write a program to calculate bill of a job work done as follows. Use if else statement.
       i.   Rate of typing 3 Rs. / page.
       ii. Printing of 1st copy 5 Rs. /page & later every copy 3 Rs. /page.   7M

UNIT–III

5. a) Explain any five string manipulation library functions with examples.   9M
   b) What is mean by recursion? Explain the purpose of recursive function.   5M

OR

6.   What is function parameter? Explain different types of parameters in C functions.   14M

UNIT–IV

7.   What is dynamic memory allocation? Write and explain the different dynamic memory allocation functions in C.   14M

OR

8. a) What is a pointer? Explain how the pointer variable declared and initialized.   7M
   b) Write advantages and disadvantages of pointers   7M

UNIT–V

9. a) Explain how the structure variable passed as a parameter to a function with example.   7M
   b)   Write a C program to read and display a text from the file.   7M

OR

10. a) What is a self-referential structure? Give an example.   5M
    b) What is a file? Explain how the file open and file close functions   9M

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Code: 19AC11T

I B.Tech. I Semester Supplementary Examinations December 2022
Algebra and Calculus
(Common to All Branches)

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. Solve the system of equations
$x + 3y + 2z = 0 , 2x - y + 3z = 0, 3x - 5y + 4z = 0, x + 17y + 4z = 0$ 14M   1   3

OR

2. Find the rank of $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ -2 & -3 & 1 & 2 \\ -3 & -4 & 5 & 8 \\ 1 & 3 & 10 & 14 \end{bmatrix}$

14M   1   3

UNIT–II

3. Verify Cayley-Hamilton theorem for the matrix A= $\begin{bmatrix} 1 & 2 & -1 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$ and hence find A^{-1}

using Cayley-Hamilton theorem.   14M   2   2

OR

4. Diagonalize the matrix A= $\begin{bmatrix} 1 & 1 & 1 \\ 0 & 2 & 1 \\ -4 & 4 & 3 \end{bmatrix}$

14M   2   2

UNIT–III

5. a) Find the first and second partial derivatives of $z = x^3 + y^3 - 3axy$ 7M   3   3

b) If $z = f(x + ct) + g(x - ct)$ then prove that $\dfrac{\partial^2 z}{\partial t^2} = c^2 \dfrac{\partial^2 z}{\partial x^2}$ 7M   3   2

OR

6. Find the maximum and minimum values of $x^3 + y^3 - 3axy$ 14M   3   3

UNIT–IV

7. a) Expand $\log_e x$ in powers of $(x - 1)$ 7M   4   3

b) Using Maclaurin's series , expand $\sin x$ in powers of x.   7M   4   3

OR

8. Trace the curve $y^2(a - x) = x^2(a + x)$ 14M   4   4

UNIT–V

9. Evaluate $\displaystyle\int_{0}^{4a}\int_{x^2/4a}^{2\sqrt{ax}} dy\,dx$ by changing the order of integration.

14M   5   3

OR

10. Evaluate $\displaystyle\int_{0}^{\pi/2} \sin^2\theta \cos^4\theta \, d\theta$

14M   5   3

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