I B.Tech. I Semester Supplementary Examinations July 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.	a)	What are the conditions for sustainable interference?	4M	CO1	L1
	b)	Classify the thin films and Explain the interference in thin films of uniform thickness by reflected light.	10M	CO1	L4
		OR			
2.		Give the theory of Fraunhofer diffraction due to single slit. Using this obtain intensity distribution curve.	14M	CO1	L2
	UNIT–II				
3.	a)	Define dielectric constant and dielectric polarization.	4M	CO2	L1
	b)	What is electronic polarization and derive the equation for electronic polarizability.	10M	CO2	L2
		OR			
4.	a)	Brief about ferroelectricity?	7M	CO2	L1
	b)	Explain frequency dependency of polarizability of dielectric materials	7M	CO2	L2
	UNIT–III				
5.	a)	State the Stoke's theorem.	4M	CO3	L1
	b)	Derive the electromagnetic wave equation in non-conducting medium	10M	CO3	L2
		OR			
6.	a)	Derive expressions for acceptance angle and numerical aperture.	10M	CO3	L2
	b)	Discuss the attenuation losses in optical fiber.	4M	CO3	L3
	UNIT–IV				
7.	a)	Define Hall effect and write its applications.	4M	CO4	L3
	b)	What is intrinsic semiconductor and explain the formation extrinsic semiconductors through doping?	10M	CO4	L2
		OR			
8.		Derive the expression for carrier concentration in n-type semiconductors.	14M	CO4	L2
	UNIT–V				
9.	a)	Define superconductivity and Explain Meissner effect in superconductor.	8M	CO5	L2
	b)	Discuss the various properties of superconductors.	6M	CO5	L3
		OR			
10.	a)	Explain synthesis of nanomaterials by ball mill method.	8M	CO5	L2
	b)	Analyse basic principles of nanomaterials.	6M	CO5	L4

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I B.Tech. I Semester Supplementary Examinations July 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	Blooms Level

UNIT–I

1.	Explain the following with neat diagrams a) Fixed value resistors b) Fixed value capacitors	14M	CO1	L2

OR

2. a)	Differentiate ideal and practical sources and draw their equivalent circuits.	8M	CO1	L2
b)	What is Inductance? Draw symbol of Inductor and write its voltage, current and energy relations.	6M	CO1	L2

UNIT–II

3. a)	Determine the equivalent capacitance when three capacitors with values 4F, 5Fand 6F are connected in series.	5M	CO2	L3
b)	State and explain Thevenin's theorem.	9M	CO2	L2

OR

4.	Verify maximum power transfer theorem for the circuit shown below.			

		14M	CO2	L3

UNIT–III

5. a)	Draw and explain the energy band diagrams of intrinsic and extrinsic semiconductors	8M	CO3	L2
b)	Write the applications of Zener and PN junction diode	6M	CO3	L3

OR

6. a)	Explain breakdown mechanism in PN junction diode	10M	CO3	L2
b)	A Ge diode carries a current of 1mA at room temperature when a forward bias of 0.15 V is applied. Estimate the reverse saturation current at room temperature.	4M	CO3	L3

UNIT–IV

7.	With the help of a neat circuit diagram, input and output waveforms, describe the operation of Half-wave rectifier.	14M	CO4	L2

OR

8. a)	With neat waveforms explain the Full wave Rectifier with LC filter.	8M	CO4	L2
b)	Define the following i)Average current ii) RMS current iii) PIV	6M	CO4	L1

UNIT–V

9. a)	With neat diagram explain the various current components of NPN transistor.	8M	CO5	L2
b)	Derive the relation between , and	6M	CO5	L3

OR

10.	With neat block diagram explain the working of CRO and list out its applications.	14M	CO5	L2

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R-19

Code: 19A511T

I B.Tech. I Semester Supplementary Examinations July 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 is Programming Language? What is the generation of programming Language? Describe it briefly.   10M
   b) Describe Structure of C Language   4M

OR

2. a) Distinguish between printf() and scanf() in the C language   7M
   b) What is a flow chart? How it is different from an Algorithm   7M

UNIT–II

3. a) Explain with examples, any Four types of operators.   7M
   b) Explain for loop and nested for loop with suitable example.   7M

OR

4. a) Describe Conditional Statements Used in C Language   7M
   b) Write a program on calculating area and perimeter of square   7M

UNIT–III

5. a) What is a function in c? How function is declared. Explain with an example.   7M
   b) Illustrate the storage classes extern, static and auto with an example.   7M

OR

6. a) Explain the following string handling functions with examples:
      (i) strcpy( ) (ii) strcat( ) (iii) strrev( ) (iv) strlen   8M
   b) Explain Preprocessor commands with examples.   6M

UNIT–IV

7. a) What is a pointer? What are the advantages of pointers?   7M
   b) Explain dynamic memory allocation with examples   7M

OR

8. a) Explain about pointer arithmetic and arrays with example.   7M
   b) Write a c program to swap two numbers using call by value and call by reference.   7M

UNIT–V

9. a) Define Structure? How structures are initialized? Explain with example.   7M
   b) Write a C program read and write the content of the file using fprintf( ) and fscanf( ) functions.   7M

OR

10. a) Explain the following functions in files:
       (i) fseek( ) (ii) ftell( ) (iii) foef( ) (iv) fopen( )   8M
    b) Define and write the syntax of the structure and union and give example for each one   7M

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Code: 19AC11T

R-19

I B.Tech. I Semester Supplementary Examinations July 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	Blooms Level

UNIT–I

1. Solve the system of equations by matrix method
$x + y + z = 6, 2x + 3y - 2z = 2, 5x + y + 2z = 13$ — 14M — CO1 — L3

OR

2. Find the Eigen values and Eigen vectors of the matrix

$A = \begin{bmatrix} 2 & 2 & 0 \\ 2 & 5 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ — 14M — CO1 — L3

UNIT–II

3. Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$ and hence find

A^{-1} using Cayley-Hamilton theorem. — 14M — CO2 — L2

OR

4. Reduce the quadratic form $x_1^2 + 3x_2^2 + 3x_3^2 - 2x_2x_3$ to canonical form by using orthogonal transformation. — 14M — CO2 — L3

UNIT–III

5. If $u = x^2 - y^2, v = 2xy \ where \ x = r\cos_{\prime\prime}, y = r\sin_{\prime\prime}$,then show that

$\dfrac{\partial(u,v)}{\partial(r,_{\prime\prime})} = 4r^3$ — 14M — CO3 — L2

OR

6. Find three positive numbers whose sum is 100 and whose product is maximum. — 14M — CO3 — L3

UNIT–IV

7. a) Expand $\sin x$ in powers of $(x - \dfrac{f}{2})$. — 7M — CO4 — L3

   b) Using Maclaurin's series , expand $\log(1+x)$ in powers of x. — 7M — CO4 — L3

OR

8. Trace the curve $x^3 + y^3 = 3axy$ — 14M — CO4 — L4

UNIT–V

9. a) Evaluate $\displaystyle\int_0^2\int_0^3 xydxdy$ — 7M — CO5 — L3

   b) Evaluate $\displaystyle\int_0^2\int_0^x y\,dydx$ — 7M — CO5 — L3

OR

10. a) Evaluate $\displaystyle\int_0^1 x^5(1-x)^3 dx$ using Beta function. — 7M — CO5 — L3

    b) Evaluate $\displaystyle\int_0^\infty x^6 e^{-2x}dx$ — 7M — CO5 — L3

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