Course Code: 23BS1T01

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

(AUTONOMOUS)

I - B. Tech I-Semester Regular/Supplementary Examinations (BR23), JAN – 2026

ENGINEERING PHYSICS (CE, EEE, ECE)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A and Part-B***

PART–A (10X2 = 20M)

		Marks	CO	BL
1. a)	Newton's rings are observed in the reflected light of wavelength 6000 Å. The diameter of 15th dark ring is 0.3 cm. Find the radius of curvature of lens used.	(2M)	CO1	L1
b)	Define dispersive power of grating.	(2M)	CO1	L1
c)	Quote the coordination number for simple cubic & face centred cubic.	(2M)	CO2	L1
d)	Clarify why X-rays are suitable for checking the crystallinity of materials.	(2M)	CO2	L1
e)	Express the relation between dielectric constant and susceptibility.	(2M)	CO3	L2
f)	Explain briefly about domain walls.	(2M)	CO3	L2
g)	State Heisenberg's uncertainty principle.	(2M)	CO4	L1
h)	Define Fermi energy level.	(2M)	CO4	L1
i)	Sketch energy band diagrams for conductor & semiconductor.	(2M)	CO5	L2
j)	Explain briefly about diffusion current in semiconductors.	(2M)	CO5	L1

PART–B (5X10 = 50M)

2.a)	i) Discuss the theory of interference in thin film and obtain the condition for minimum and maximum in the case of reflected system. ii) A soap film of refractive index 1.5 and thickness 7000 Å is exposed to white light. Find the wavelength in the visible region is reflected.	8+2 (M)	CO1	L2
	(OR)			
3.a)	Describe the Fraunhofer diffraction due to double slit and obtain the conditions for minimum and maximum.	10(M)	CO1	L2
4.a)	Interpret FCC is more closely packed structure than BCC & SC by working out their atomic packing fractions.	10(M)	CO2	L3
	(OR)			
5.a)	Explain the Laue method for determination of crystal structure with suitable diagram.	10(M)	CO2	L2

6.a)	Interpret the various types of polarization mechanism in dielectric materials.	10(M)	CO3	L3
	(OR)			
7.a)	Interpret the origin of magnetic moment in materials.	10(M)	CO3	L3
8.a)	i) Show that the energy of an electron in a potential box are quantized. ii) Find the energy required to excite it from its ground state to the fifth excited state. If it is trapped in a one-dimensional box of 0.1 nm length.	8+2 (M)	CO4	L3
	(OR)			
9.a)	Develop an expression for the electrical conductivity based on quantum free electron theory.	10(M)	CO4	L3
10.a)	Show that the Hall coefficient is negative for n-type semiconductor.	10(M)	CO5	L3
	(OR)			
11.a)	Develop an expression for the carrier concentration of an intrinsic semiconductor.	10(M)	CO5	L3

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