

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)**

I-B. Tech II -Semester Regular/Supplementary Examinations (BR23), June - 2025

SUBJECT NAME: ENGINEERING PHYSICS.

BRANCH: CSE, CSE-AI&DS, AI&ML, INF

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
1a) What do you mean by coherent source?	(2M)	CO1	L1
b) Distinguish between polarized and unpolarised light?	(2M)	CO1	L2
c) Explain about atomic packing fraction in crystallography?	(2M)	CO2	L2
d) Calculate the radius of lead atom as it exhibits FCC structure and side of the unit cell is of 4.95\AA	(2M)	CO2	L3
e) Define Dielectric Polarization?	(2M)	CO3	L1
f) What are the classification of Magnetic Materials?	(2M)	CO3	L1
g) What are de-Broglie's Matter waves and explain their properties?	(2M)	CO4	L2
h) State and explain Heisenberg uncertainty principle?	(2M)	CO4	L2
i) Distinguish between P type and N type semiconductors?	(2M)	CO5	L3
j) Write a short notes on drift current?	(2M)	CO5	L1

PART-B (5X10 = 50M)

2a. Derive an expression for wavelength of sodium vapour lamp by using Newton's rings experiment?	7(M)	CO1	L2
b. Calculate the wavelength of light used in Newton's rings experiment if the diameter of 15 th ring is 0.59cm and that of 5 th ring is 0.336cm and the radius of curvature of Plano convex lens is 100cm.	3(M)	CO1	L5
(OR)			
3a. Explain the theory of Fraunhofer diffraction at single slit?	5(M)	CO1	L3
b. Describe the Construction and working of Nicol prism?	5(M)	CO1	L3
4a. Derive the expression for inter planar distance between consecutive planes described by Miller indices(hkl).	5(M)	CO2	L2
b. Show that the FCC structure possesses maximum packing density than BCC?	5(M)	CO2	L3
(OR)			
5a. What are Miller indices and explain with proper example how to determine Miller indices?	5(M)	CO2	L2
b. Deduce Bragg's law of X-ray diffraction in crystals?	5(M)	CO2	L4
6a. Derive Clausius-Mosotti relation for elemental solid dielectrics?	7(M)	CO3	L2

b.	Write a short notes on Internal field in dielectrics?	3(M)	CO3	L2
(OR)				
7a.	Explain the ferromagnetic hysteresis on the basis of domain theory?	6(M)	CO3	L2
b.	Distinguish between soft and hard magnetic materials?	4(M)	CO3	L4
8a.	What is a wave function and give the physical significance of wave function?	3(M)	CO4	L2
b.	Derive Schrodinger time dependent wave equation for a free particle?	7(M)	CO4	L3
(OR)				
9a.	Derive an expression for wave function of a particle in one dimensional potential well?	7(M)	CO4	L3
b.	An electron is confined to a one dimensional potential box of length $2A^0$. Calculate the energies correspond to the second and fourth quantum states?	3(M)	CO4	L4
10a	State and explain Hall effect? Mention some applications of Hall effect?	6(M)	CO5	L2
b.	Deduce the Einstein relation for drift and diffusion current?	4(M)	CO5	L3
(OR)				
11a	Derive an expression for the concentration of electrons in conduction band of an Intrinsic semiconductor?	7(M)	CO5	L3
b.	Explain the Formation of energy bands?	3(M)	CO5	L2
