Code No.: AP202BS	R20	H.T.No.			8	R					

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–B.TECH–II–Semester End Examinations (Supply) - December- 2025
APPLIED PHYSICS
(Common for CSM, ECE, MECH, AI&DS)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

1.	a)	Give physical significance of wave function.	[2M]
	b)	Explain the concept of effective mass of electron.	[2M]
	c)	What is Hall Effect? Mention few applications.	[2M]
	d)	Explain I-V characteristics of a PN junction diode.	[2M]
	e)	Mention different types of polarization mechanisms in dielectrics.	[2M]
	f)	What is Bohr magneton? How is it related to magnetic moment of electron?	[2M]
	g)	State the important characteristics of laser radiation?	[2M]
	h)	Distinguish between step index and graded index fibers.	[2M]
	i)	What is meant by quantum confinement?	[2M]
	j)	State the principle of X-ray diffraction (XRD).	[2M]

PART-B **(50 Marks)**

2.	Derive Schrodinger's time- independent wave equation for a free particle.	[10M]
	OR	
3.	Explain the classification of solids into conductors, semiconductors and insulators on the basis of band theory.	[10M]
4.	Derive an expression for the carrier concentration in p-type extrinsic semiconductor.	[10M]
	OR	
5.	Explain with a neat sketch the principle, construction and working of solar cell.	[10M]
6.	Explain the concept of internal field in solids and hence obtain an expression for elemental solid dielectric.	[10M]
	OR	
7.	Discuss domain theory of ferromagnetism on the basis of hysteresis curve.	[10M]
8.	Explain with a neat diagrams (i) absorption (ii) spontaneous emission and (iii) stimulated emission of radiation.	[10M]
	OR	
9.	Describe different types of optical fibers by giving the refractive index profiles and propagation details.	[10M]
10.	What is the origin of nanotechnology? Why do nanomaterials exhibit different properties explain in detail?	[10M]
	OR	
11.	Describe the principle, construction and working of Transmission electron microscope (TEM) and give its applications.	[10M]

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