30/25

Code No.: R22AP202BS | R22 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–B.TECH–II–Semester End Examinations (Supply) - January- 2025
APPLIED PHYSICS
(Common for ECE, CSE, IT)

[Time: 3 Hours] **[Max. Marks: 60]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 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 **(10 Marks)**

1. a)	Define Blackbody radiation.	[1M]
b)	State Heisenberg's uncertainty Principle.	[1M]
c)	Explain the terminals of transistor.	[1M]
d)	Write the applications of PN Junction diode.	[1M]
e)	Define Ferroelectricty.	[1M]
f)	Define the term magnetic field induction.	[1M]
g)	Explain Quantum Confinement.	[1M]
h)	Write applications of nanomaterials.	[1M]
i)	What is population inversion?	[1M]
j)	Explain the principle of Optical fibers.	[1M]

PART-B **(50 Marks)**

2.a)	Explain Davisson–Germer's experiment to show the existence of matter waves.	[7M]
b)	Write a note on physical significance of the wave function.	[3M]
	OR	
3.	Show that the energies of a particle in a potential box are quantized.	[10M]
4.	Define Hall effect and derive an expression for Hall voltage and Hall co-efficient.	[10M]
	OR	
5.a)	Write the differences between Direct and Indirect bandgap semiconductors.	[3M]
b)	Explain the construction, working and V-I characteristics of a PN junction diode in forward and reverse bias.	[7M]
6.a)	Define the term Polarization? Explain different types of polarization.	[7M]
b)	Write a note on bubble memory devices.	[3M]
	OR	
7.	Write a note on super capacitors and explain its types.	[10M]
8.a)	Write the differences between Bottom-Up and Top-Down method of fabrications.	[3M]
b)	Explain how the nano particles are synthesized using PVD technique.	[7M]
	OR	
9.	Explain the construction and working of SEM with the help of neat diagram.	[10M]
10.	Explain the construction and working of He-Ne laser and write its applications.	[10M]
	OR	
11.a)	Describe different types of fibers by giving the refractive index profiles and propagation details.	[7M]
b)	Write a note on different types of losses in Optical fibers.	[3M]

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