Code No.: R22AP102BS | R22 | H.T.No. | | | 8 | R | | | | | | |

CMR ENGINEERING COLLEGE:: HYDERABAD
UGC AUTONOMOUS
I–B.TECH–I–Semester End Examinations (Supply) - September- 2023
APPLIED PHYSICS
(Common for CSC, CSD, CSM)

[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)	State Heisenberg uncertainty principle.	[1M]
b)	Define the effective mass of an electron.	[1M]
c)	What is meant by semiconductor? Give examples.	[1M]
d)	What is meant by LED? Give its principle..	[1M]
e)	Define polarization vector and displacement vector.	[1M]
f)	Define magnetic susceptibility.	[1M]
g)	What are nanomaterials? Give examples.	[1M]
h)	List out the synthesis techniques under top down approach.	[1M]
i)	What are different methods of pumping?	[1M]
j)	What are the conditions to be satisfied for total internal reflection?	[1M]

PART-B **(50 Marks)**

2. Derive time independent Schrodinger wave equation and explain the significance of the wave function ψ. [10M]

OR

3. Explain the behavior of an electron moving in a field of periodic potential using Kronig and Penny model. [10M]

4. What is Hall Effect? Derive the Hall coefficient for P-type and N-type semiconductors. [10M]

OR

5. Discuss the structure, working principle and characteristics of solar cells. [10M]

6. Explain the different types of polarization mechanisms involved in a dielectric material. [10M]

OR

7. What is meant by Hysterisis loss? Classify and explain the magnetic materials as soft and hard on the basis of Hysterisis loop. [10M]

8. Discuss the phenomenan of surface to volume ratio, quantum confinement in nanomaterials and mentions the applications of nanomaterials. [10M]

OR

9. Describe the principle construction and working of Transmission Electron Microsocpe (TEM) and give its limitations. [10M]

10. Explain what is meant by molecular laser. Discuss the construction and working principle of CO_2 alser. [10M]

OR

11. Describe the propagation of light thorough an optical fiber and derive the expression for Acceptance angle. [10M]

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