

Code No.: AP102BS

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CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I-B.TECH-I-Semester End Examinations (Supply) -February- 2024
APPLIED PHYSICS
(Common for CSE, IT, CSC, CSD)

[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) Mention the characteristics of matter waves. [2M]
- b) Write down the physical significance of the wave function. [2M]
- c) What is Hall effect? Give its importance. [2M]
- d) What is a solar cell? Mention its applications. [2M]
- e) What are dipole moment and dielectric constant in dielectrics? [2M]
- f) Distinguish between anti-ferro and ferri magnetic materials. [2M]
- g) What are the characteristics of a laser? [2M]
- h) Mention the losses in an optical fiber. [2M]
- i) What is surface to volume ratio at the nano scale? [2M]
- j) Outline the various applications of nanomaterials. [2M]

PART-B

(50 Marks)

2. Derive an expression for Schrodinger's time-independent wave equation. [10M]
- OR**
3. Describe the classification of solids based on band theory. [10M]
 4. Derive an expression for the carrier concentration in a p-type extrinsic semiconductor. [10M]
- OR**
5. Discuss the working of the p-n junction diode at various biased conditions. [10M]
 6. Deduce the expression for the Classius-Mossotti equation in the case of solid dielectrics. [10M]
- OR**
7. Explain the concept of piezo-electricity and ferro-electricity. [10M]
 8. Describe the construction and working of the Ruby laser with a neat diagram. [10M]
- OR**
9. Derive an expression for the acceptance angle and numerical aperture of an optical fiber. [10M]
 10. What is bottom up technique, explain the fabrication of nanomaterials by using the Sol-Gel method. [10M]
- OR**
11. Explain how X-ray diffraction can be used to characterize nanoparticles. [10M]
