

Code No.: AP202BS

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CMR ENGINEERING COLLEGE : HYDERABAD

UGC AUTONOMOUS

I-B.TECH-II-Semester End Examinations (Supply) - September- 2023

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) Explain the physical significance of wave function? [2M]
- b) What are the draw backs of classical free electron theory. [2M]
- c) What is an intrinsic semiconductor? [2M]
- d) Draw the I-V characteristics of a solar cell. [2M]
- e) What is Ferro-electricity? Give any two examples. [2M]
- f) Write the properties of Ferri magnetic materials. [2M]
- g) What is population inversion? How it is achieved. [2M]
- h) Explain graded-index optical fiber. [2M]
- i) How TEM can be used to characterize nano particles? [2M]
- j) List the various applications of nano materials. [2M]

PART-B

(50 Marks)

2. What is de-Broglie hypothesis? Explain Davisson and Germer's experiment in support of this hypothesis. [10M]
- OR**
3. Discuss with suitable mathematical expressions, the motion of an electron in a periodic potential. [10M]
 4. What is a Fermi level? Explain the variation of Fermi level with temperature in case of extrinsic semiconductors. [10M]
- OR**
5. Explain how a p-n junction is formed? Discuss the I-V characteristics curve of a p-n junction diode. [10M]
 6. Explain the various polarization mechanisms in dielectric materials. [10M]
- OR**
7. Define magnetic moment? Explain the classification of magnetic materials on basis of magnetic moment. [10M]
 8. With the help of suitable diagrams, explain the principle, construction and working of a Ruby laser. [10M]
- OR**
9. Describe the principle of an optical fiber and derive an expression for acceptance angle and numerical aperture of an optical fiber. [10M]
 10. Write a short note on i) Surface to volume ratio and ii) Quantum confinement. [10M]
- OR**
11. Explain the principle, construction and working of Scanning Electron Microscope (SEM). [10M]
