| Code No.: AP202BS | R20 | H.T.No. | | | 8 | R | | | | | | |
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**CMR ENGINEERING COLLEGE: : HYDERABAD**
**UGC AUTONOMOUS**
**I–B.TECH–II–Semester End Examinations (Supply) –June - 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) | What is de-Broglie Hypothesis? | [2M] |
| | b) | What is band gap range in between valence band and conduction band in case of insulators? | [2M] |
| | c) | What is extrinsic semi conductor? | [2M] |
| | d) | Write any two advantages of LED. | [2M] |
| | e) | What is meant by dielectric polarization? | [2M] |
| | f) | What are the properties of ferro magnetic materials? | [2M] |
| | g) | Write any two applications of LASERS in medical field. | [2M] |
| | h) | What is Numerical aperture? | [2M] |
| | i) | What is Nano technology? | [2M] |
| | j) | What are the applications of SEM? | [2M] |

**PART-B** **(50 Marks)**

| | | |
|---|---|---|
| 2. | Derive the energy expression in particles in a potential box and show that energies are quantized. | [10M] |
| | **OR** | |
| 3. | Discuss Kronig-Penney model of a crystal in a periodic potential field. | [10M] |
| 4. | Explain Direct and indirect band gap semi conductors. | [10M] |
| | **OR** | |
| 5. | Discuss formation of PN junction and also explain I-V characteristics of PN junction diode. | [10M] |
| 6. | Derive the expression for internal field seen by an atom in an infinite array of atoms subjected to an external field. | [10M] |
| | **OR** | |
| 7. | What is Hysteresis? Explain Hysteresis nature in a ferro magnetic material | [10M] |
| 8. | Explain the construction and working of Ruby laser. | [10M] |
| | **OR** | |
| 9. | Derive the expression for acceptance angle in an optical fiber. | [10M] |
| 10. | Describe the process of synthesis of nano materials using chemical vapour deposition method. | [10M] |
| | **OR** | |
| 11. | Explain how X-ray diffraction (XRD) can be used to characterize nano particles. | [10M] |

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