

CMR ENGINEERING COLLEGE: : HYDERABAD**UGC AUTONOMOUS****I-B.TECH-II-Semester End Examinations (Regular) - June- 2025****APPLIED PHYSICS****(Common for CSE, ECE, 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) State Heisenberg uncertainty Principle. [1M]
- b) Write the expression for Effective Mass of an electron. [1M]
- c) Draw the V-I characteristics of P-N Junction diode. [1M]
- d) What are the types of materials used to synthesize LED? [1M]
- e) List out any two applications of Memory Devices. [1M]
- f) Define the term Polarization in dielectrics. [1M]
- g) What are the applications of Nanotechnology? [1M]
- h) What is Quantum confinement? [1M]
- i) What are the four characteristics of LASER? [1M]
- j) Name any two Losses in Optical Fiber. [1M]

PART-B**(50 Marks)**

- 2.a) Derive expression for Planck's formula for the distribution of energy in Black body radiation. [8M]
- b) Outline the interpretation on physical significance of wave function. [2M]

OR

3. Describe Kronig – Penney model with the relevant sketches. [10M]
4. Outline the Phenomenon of Hall effect. Derive an Expression for Hall Coefficient of Semiconductor material. [10M]

OR

5. Discuss the Construction, Working and Applications of Solar cell. [10M]
6. Compare and Contrast the Ferroelectric, Piezoelectric and Pyro electric Materials. [10M]

OR

7. Examine the Hysteresis behavior of Ferro Magnetic materials with the relevant sketch. [10M]
8. Surface to Volume ratio and Quantum Confinement are two important characteristics of Nano Materials. How they differ from Bulk materials. Justify? [10M]

OR

9. Write a note on characterization technique of TEM. [10M]
10. Define Population Inversion and explain the construction and working mechanism of RUBY LASER with the necessary sketches. [10M]

OR

11. Evaluate the expression for numerical aperture and acceptance angle of the optical fiber cable with the relevant sketch. [10M]
