

Code No. 2957/AICTE/M

**FACULTY OF ENGINEERING**  
**B.E. (CE/EE/IOSL/ECE/CSE/CME) (AICTE) II-Semester (Main & Backlog)**  
**Examination, December 2020**

Time : 2 Hours

Subject: Physics

Max. Marks: 70

Note: Answer

5 questions from Part-A & any four questions from Part-B.

**PART - A (5 X 2 = 10 Marks)**

- 1 Draw a plane in cubic crystal which have miller Indices  $< 101$ .
- 2 What is Burgers vector?
- 3 Explain the concept of a hole.
- 4 What is a ferroelectric materials, and mention their two applications?
- 5 Write the physical significance of wave function.
- 6 What are D, E and P and write the relation between them?
- 7 Distinguish between soft and hard magnetic materials.
- 8 Prove that superconductor is a diamagnetic material.
- 9 What is population Inversion? Explain.
- 10 Define Acceptance angle and Numerical aperture in fiber optics.

**PART - B (4 X 15 = 60 Marks)**

- 11 Derive an equation for concentration of Frenkel defects in an ionic crystal.
- 12 Define Hall effect and derive an equation for Hall coefficient.
- 13 Apply Schrodinger equation to particle in 1-dimensional box, and find its energy.
- 14 Explain Weiss molecular field theory of ferromagnetism.
- 15 Explain general properties of superconductors and discuss BCS theory.
- 16 Explain construction and production mechanism of Ruby Laser.
- 17 Derive an equation for Electromagnetic wave in a free space and explain Poynting theorem.

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