

**FACULTY OF ENGINEERING**  
**B.E. / B.Tech. (Bridge Course) I-Semester (Backlog) Examination,**  
**November 2020**

**Subject : Engineering Physics**

**Time : 2 Hours**

**Max. Marks: 75**

**Note: Answer any seven questions from Part-A & any three questions from Part-B.**

**PART – A (7x3=21 Marks)**

- 1 Explain different types of Interference.
- 2 Distinguish between Fresnel and Fraunhofer diffraction.
- 3 State and explain Malus Law.
- 4 Give the physical significance of ' $\psi$ '.
- 5 Match the following:
  1. Inner most part of the optical fibre (a) Division of amplitude
  2. Hologram is related to (b) Super conductor
  3. Laser beam consists of (c) Interference
  4. Graded index fibers (d) Highly coherent photons
  5. Meissner effect (e) Core
  6. Newton's rings (f) Refractive index of the core increases
- 6 Calculate the inter planar spacing for (1 2 3) plane in a cubic lattice where lattice constant is 2.4 Å.
- 7 What are intrinsic and extrinsic semiconductors? Give examples.
- 8 Define Hall effect and their applications.
- 9 Write the principle of Auger (OJ) process.
- 10 Give four applications of super conductors.

**PART – B (3x18=54 Marks)**

- 11 (a) Describe the experimental arrangement to produce Newton's rings.  
(b) What is diffraction? Explain the diffraction due to single and discuss the intensity conditions along with intensity distribution graph.
- 12 (a) Explain the construction and working of Ruby laser.  
(b) By considering Schrodinger's time independent equation deduce the expression for energy values for infinite square well.
- 13 (a) Write down the salient features of Kronig-Penny model and based on this model discuss the classification of solids into conductors, semiconductors and insulators.  
(b) Describe in detail the powder diffraction experiment to determine the lattice constant of cubic crystal.
- 14 (a) What is electronic polarization? Obtain an expression for electronic polarizability.  
(b) Explain the hysteresis curve in ferromagnetic materials.

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- 15 (a) Derive an expression for carrier concentration in intrinsic semiconductors.  
(b) Explain the ball milling method of preparing nano materials and give some applications.
- 16 (a) Obtain an expression for acceptance angle and numerical aperture for an optical fibre.  
(b) Distinguish between Type-I and Type-II superconductors.
- 17 (a) What is hologram? Explain the recording and reconstruction process of hologram.  
(b) Describe the construction and working of Scanning Electron Microscope (SEM).

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