

I B. Tech I Semester Supplementary Examinations, December - 2021
ENGINEERING PHYSICS-I
(Com to All Branches)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
~~~~~

1. a) What is interference of light? Describe Young's experiment for demonstration of interference of light. (10M)
- b) In a Young's double slit experiment, the angular width of a fringe found on a distant screen is  $0.1^\circ$ . The wavelength of light used is 600nm. What is the spacing between the slits? (5M)
2. a) Analyze qualitatively Fraunhofer diffraction due to a double slit. (10M)
- b) In double slit Fraunhofer diffraction calculate the fringe spacing on a screen 50cm away from the slits, if they are illuminated with blue light of wave length 480nm. Given slit separation is 0.1mm and slit width is 0.020mm. (5M)
3. a) How can Nicol's prism be used as polarizer and analyzer? Explain in detail with the help of a diagram. (10M)
- b) What are quarter and half wave plates? (5M)
4. a) Define the terms coordination number, atomic radius and packing fraction. Calculate these factors for simple cubic, body centered cubic and face centered cubic crystals. (10M)
- b) If the lattice constant of a cubic crystal is 3nm, find the interplanar spacing between (111) planes. (5M)
5. a) Describe Laue's method of determination of crystal structure. (10M)
- b) Derive Bragg's law of x-ray diffraction. (5M)
6. a) Describe the construction and working of Ruby laser with relevant energy level diagram. (10M)
- b) Discuss medical applications of lasers. (5M)
7. a) Draw the block diagram of optical fibre communication system and explain functions of each block. (10M)
- b) Explain briefly different types of fibres with neat diagrams. (5M)
8. a) What is the principle of ultrasonic testing? Discuss the use of ultrasonics for non-destructive testing. (10M)
- b) What are the advantages and limitations of ultrasonic testing? (5M)