

Code No: R10103

R10

SET - 1

I B. Tech I Semester Supplementary Examinations, May - 2017

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 the conditions necessary for sustained interference. Explain Young's experiment demonstrating interference of light. (10M)
- b) In a Newton's ring experiment the diameter of the 5th dark ring is reduced to half of its value on introducing a liquid below the convex surface of the lens. Calculate the refractive index of the liquid. (5M)
2. a) Describe qualitatively Fraunhofer diffraction at single slit. (10M)
- b) Differentiate between single-slit diffraction pattern and double slit diffraction pattern. (5M)
3. a) Discuss various types of polarized lights. (10M)
- b) Define Double refraction. Give the differences between ordinary and extra-ordinary rays (5M)
4. a) Define atomic packing factor. Calculate atomic packing factor for SC, BCC and FCC structures. (10M)
- b) The atomic radius of copper is $1.278 \text{ \AA}$. It has atomic weight 63.54. Find the density of copper. (5M)
5. a) Derive an expression for the inter planar distance in terms of Miller indices for a cubic structure. (10M)
- b) Sketch the following atomic planes in a simple cubic structure: (010), (110) and (111). (5M)
6. a) What is a semiconductor laser? Describe its construction and working. (10M)
- b) Explain application of lasers in medical field. (5M)
7. a) Define Acceptance angle of an optical fibre and derive an expression for it. (7M)
- b) With the help of neat labeled diagrams explain step-index and graded index optical fibres. (8M)
8. a) Explain the basic principle involved in ultrasound testing and also write the importance of couplant. (10M)
- b) Elucidate the use of ultrasonics in mechanical field. (5M)