

**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 5<sup>th</sup> 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)

