Subject Code: R10103/R10 **Set No - 1**

I B.Tech I Semester Supplementary Examinations December - 2016
ENGINEERING PHYSICS-I
(Common to All Branches)

Time: 3 hours **Max. Marks: 75**

Answer any **FIVE** Questions
All Questions carry equal marks
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1. (a) Describe an interference method to determine the refractive index of a transparent liquid given in a very small quantity. Derive the formula used.
   (b) In Newton's rings experiment, the diameter of the 10th dark ring changes from 1.40cm to 1.27cm, when a liquid is introduce between the plate and the lens. Calculate the refractive index of the liquid. [10+5]

2. (a) Define resolving power of a grating. Obtain an expression for resolving power in the case of plane transmission grating.
   (b) State the differences between Interference and Diffraction. [10+5]

3. (a) Explain the principle, construction and working of Nicol's prism.
   (b) Calculate the thickness of a Mica sheet required for making a quarter wave plate for $\lambda = 5460$ ´ The indices of refraction for the ordinary and extra-ordinary rays in mica are 1.586 and 1.592 respectively. [8+7]

4. (a) Explain unit cell and Lattice parameters. What is a primitive cell and how does it differ from unit cell?
   (b) Calculate the atomic packing factor of Body Centered Cubic Lattice. [8+7]

5. (a) Describe Laue's method for determination of crystal structure.
   (b) Derive Bragg's law of x-ray diffraction. [8+7]

6. (a) Describe the construction and working of a ruby laser.
   (b) Explain the characteristics of a laser beam [10+5]

7. (a) Describe the basic elements of a fibre optics communication system with block diagram.
   (b) An optical fibre in air has numerical aperture of 0.4. Determine the acceptance angle. [10+5]

8. (a) Explain Pulse-Echo testing techniques in detail.
   (b) Discuss any four applications of ultrasonics. [10+5]

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