I B.Tech I Semester Supplementary Examinations May/June - 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) Derive the expression for fringe width in the case of Young's double slit experiment. Prove that the interference dark and bright fringes are of equal width.
   (b) What is a thin film? Obtain conditions for minima and maxima in case of thin films due to reflected light.

   [8+7]

2. (a) Discuss the Fraunhoffer diffraction at a single slit. Obtain the condition for principal maximum and minimum.
   (b) State and explain Rayleigh's criterion for resolution.

   [8+7]

3. (a) With the help of neat diagrams explain how Nicol's prism is used to produce and analyze plane polarized light.
   (b) Discuss in detail the phenomenon of double refraction.

   [8+7]

4. (a) Define the terms coordination number, atomic radius and packing density. Calculate these factors for simple cubic, body centered cubic and face centered cubic crystals.
   (b) Deduce the packing fractions of SC and BCC structures.

   [8+7]

5. (a) What are miller indices? Draw the following planes in a cubic unit cell: (110), (311), and (011).
   (b) Deduce Bragg's law of diffraction in crystals.

   [8+7]

6. (a) Describe the construction and working of He-Ne laser with relevant energy level diagram. List out its advantages over ruby laser.
   (b) Discuss the various applications of the LASERS in detail.

   [8+7]

7. (a) Draw the block diagram of optical fibre communication system and explain functions of each block.
   (b) Explain applications of the optical fibres.

   [8+7]

8. (a) What is non-destructive testing? Explain with principle how flaw in a solid can be detected by non-destructive method using ultrasonics.
   (b) What are the advantages and limitation of ultrasonic testing?

   [8+7]

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