Code No: 9ABS102 **R09**

I Year B.Tech(R09) Supplementary Examinations, December 2010.
ENGINEERING PHYSICS
(Common to Aeronautical Engineering, Biotechnology, Civil Engineering, Mechanical Engineering, Computer Science & Engineering, Electronics & Communication Engineering, Electrical & Electronics Engineering, Electronics & Control Engineering, Electronics & Computer Engineering, Electronics & Instrumentation Engineering, Information Technology, Computer Science & Systems Engineering,)

Time: 3 hours **Max Marks: 70**

Answer any FIVE questions
All questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) What is meant by diffraction of light? Explain it on the basis of Huygen's wave theory.
   (b) Explain with necessary theory how wavelength of spectral line is determined using plane diffraction grating.
2. (a) Define packing fraction and Show that FCC crystals are closely packed than BCC crystals.
   (b) Explain the crystal structures of BCC and FCC crystals.
3. (a) Explain the origin of energy bands in solids.
   (b) On the basis of band theory explain how the crystalline solids are classified into metals, semiconductors and insulators.
4. (a) Derive the diode equation.
   (b) Write notes on LED and LCD.
5. (a) What are antiferromagnetic materials? Explain the variation of its susceptibility with temperature.
   (b) A magnetic material has a magnetization of 3300 Am^{-1} and flux density of 0.0044 Wbm^{-2}. Calculate the magnetizing force and the relative permeability of the material.
6. (a) Describe the important characteristics of laser beam.
   (b) Explain the process of stimulated absorption of radiation along with its importance.
7. (a) Discuss the minimization of modal dispersion in the graded index optical fiber.
   (b) An optical fiber has a numerical aperture of 0.20 and cladding refractive index of 1.59. Determine the refractive index of core and the acceptance angle for the fiber in water which has a refractive index of 1.33.
8. (a) Mention the important applications of carbon nanotubes in information technology.
   (b) Mention the important applications of carbon nanotubes in biomedical fields.

⋆ ⋆ ⋆ ⋆ ⋆