B.Tech I Year (R09) Supplementary Examinations, November/December 2012
ENGINEERING PHYSICS
(Common to all branches)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1 (a) Explain interference of light due to thin films.
  (b) What is the difference between interference and diffraction?

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) What are matter waves? Explain their properties.
  (b) Obtain the expression for the wavelength of matter waves.
  (c) Calculate the wavelength associated with an electron raised to a potential 1600 V.

4 (a) Write notes on forward and reverse biasing of p-n junction.
  (b) Draw and explain band diagram of p-n junction diode.

5 (a) Explain electronic polarization in a dielectric.
  (b) An elemental dielectric has a relative dielectric constant of 12. It also contains 5×10^{28} atoms/ m^3. Calculate its electronic polarisability assuming Lorentz field.

6 (a) With neat diagrams describe the construction and working of a ruby laser.
  (b) What are the main disadvantages of ruby laser?

7 (a) What is modal dispersion in optical fiber and discuss it in the case of multi mode step index optical fiber?
  (b) The refractive index of the core is 1.5 and the fractional change In refractive index between the core and cladding is 1.8%. Calculate (i) The velocity of light in the core and (ii) the velocity of light in the cladding.

8 (a) Explain the magnetic properties exhibited by carbon nanotubes.
  (b) Explain the basic factors of carbon nanotubes on which its magnetic properties depends.

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