Code: R7100103

R07

B.Tech I Year (R07) Supplementary Examinations, June 2013
ENGINEERING PHYSICS
(Common to CE and ME)

Time: 3 hours

Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks
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1 (a) What is interference? Derive an expression for fringe width and show that the fringes are uniformly spaced.
  (b) What are the different methods of obtaining polarization? Define double refraction.
  (c) A parallel beam of sodium light of wavelength $5890\,A°$ is incident on a thin glass plate of refractive index 1.5, such that the angle of refraction in the plate is $60°$. Calculate the smallest thickness of the plate which will make it appear dark by reflection.

2 (a) Explain in detail magnetostriction method of producing ultrasonic waves.
  (b) Discuss the different factors affecting the architectural acoustics and give some remedies.

3 (a) Define magnetic susceptibility, magnetic permeability, magnetic induction and magnetization.
  (b) Explain BCS theory of super conductors.
  (c) The field strength of a magnetic material is $10^6\,amp/mt$. If the susceptibility is $0.5\,X\,10^{-5}$, calculate intensity of magnetization and flux density in the material.

4 (a) Describe the seven crystal systems with diagrams.
  (b) Explain the powder method of crystal analysis.

5 (a) Explain the characteristics of a laser beam.
  (b) Describe the construction and working of ruby laser.

6 (a) Define numerical aperture and acceptance angle. Derive expressions for them.
  (b) What is holography? Explain the construction of a hologram.

7 (a) Write short notes on piezoelectricity and Ferroelectricity.
  (b) What are lattice vibrations? Derive an expression for thermal conductivity.

8 (a) Explain fundamental concepts of nanotechnology.
  (b) Discuss various physical and chemical properties of nanomaterials.

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