

## PHYSICS - 2012

1. a) What is entropy and disorder? (4)
- b) State and explain principle of super positron. (3)
- c) Total internal reflection (3)
- d) Applications of ferroelectrics (3)
2. a) Distinguish between reversible and irreversible process. (4)
- b) Discuss the various steps involved in a Carnot cycle and derive an expression for its efficiency in terms of source and sink temperatures.
3. a) State and explain Biot - Savart's law. (6)
- b) Derive an expression for the magnetic field at a point on the axis of a current carrying circular loop. (8)
4. a) Discuss the construction and working of Michelson Interferometer. (10)
- b) Explain the double refraction in uniaxial crystals(4)
5. a) Discuss the applications of Lasers (6)
- b) What is numerical aperture and the acceptance angle of an optical fiber? (4)
- c) Discuss briefly the optical fiber communication system.
6. a) Explain Piezoelectric effect. (4)
- b) Describe the principle and production of ultrasonics by Magnetostriction with a neat circuit diagram (10)
7. a) State an explain uncertainty principle. (4)
- b) Discuss Chart Kronig – Penny Model. (10)
8. a) Discuss Meisner effect and explain applications of superconductors. (6)
- b) What is nanophase materials? Explain the synthesis of nanostructured materials. (8)