

34615

Name : _____

Reg. No: _____



COMBINED I & II SEMESTER B.TECH (ENGINEERING) DEGREE EXAMINATION
APRIL 2013
(2K Scheme)

EN 2K 103 A - ENGINEERING PHYSICS (A)
(Common to AI, CS, EE, EC, IT, PT & IC)

Time: 3 Hours

Maximum: 100 Marks

Answer all questions.

Part A

- I (a) What are coherent sources? How are they realized in Practice.
(b) What is a Polaroid. Mention two applications of a polarid.
(c) Bring out the comparison between Newtonian mechanics & Quantum Mechanics.
(d) What is ESR. Explain its principle & give two applications of ESR.
(e) Explain how a hologram is produced.
(f) Explain the working of a photo transistor. Give two uses.
(g) Explain the modes in an optical fiber. What are its applications?
(h) Distinguish between type I and Type II superconductors.

(8 x 5 = 40 Marks)

Part B

- II (a) What is a plane transmission grating. Discuss the theory of a diffraction grating.
(Or)
(b) (i) Explain the formation of colours in thin films. Obtain the condition for brightness in the case of transmitted system. (10)
(ii) Fringes of equal thickness are observed in a thin glass wedge of refractive index 1.515. If the fringe spacing is 10^{-3} m & wavelength of light used is 5893 \AA , Calculate the angle of the wedge. (5)
- III (a) Define probability density. Derive the time independent schrodinger equation for a free particle.
(Or)
(b) (i) What is Piezo electric effect? How is its used for the generation of ultrasonics (11)
(ii) Find the fundamental frequency of vibration of a quartz crystal of thickness 10^{-3} metre. Young's modulus of quartz = $7.93 \times 10^{10} \text{ N/m}^2$ Density of quartz = $2.65 \times 10^3 \text{ kg/m}^3$. (4)

Turn over

- IV (a) (i) Explain why laser action cannot take place without population inversion between atomic energy levels? (7)
- (ii) Describe the construction and working of a He-Ne laser. (8)
- (Or)
- (b) (i) Define acceptance angle of optical fiber. Derive an expression for the acceptance angle. (11)
- (ii) Calculate the acceptance angle of a fiber having core refractive index = 1.50 and cladding refractive index = 1.45. (4)
- V (a) (i) Describe the band structure of a semi conductor. (9)
- (ii) Distinguish between Donor impurities and acceptor impurities. (6)
- (Or)
- (b) (i) What is Hall effect? (4)
- (ii) How is Hall voltage and Hall coefficient measured experimentally? (11)

(4 x 15 = 60 Marks)
