

B.Tech I Year (R13) Supplementary Examinations December/January 2014/2015
ENGINEERING PHYSICS
(Common to all branches)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) What is an optical resonator?
 - b) (What is meant by total internal reflection?
 - (c) What is Schottky defect?
 - (d) What is Piezoelectricity?
 - (e) What is Hiesenberg's uncertainty principle?
 - (f) What are the sources of electrical resistance?
 - g) (What is the direct band-gap semiconductor?
 - (h) Define hysteresis.
 - (i) What is flux quantization?
 - (j) What is meant by quantum confinement?

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT - I

- 2 (a) How do you determine wave length of light using Newton's rings experiment?
(b) Newton's rings are observed in the reflected light of wave length 5900 \AA . The diameter of 10^{th} dark ring is 0.5 cm. Find the radius of curvature of lens used?

OR

- 3 (a) Define absorption, stimulated emission and population inversion.
(b) Differentiate single mode and multimode fibres

UNIT - II

- 4 What are Miller indices? Determine the expression for inter planer spacing in terms of Miller indices.

OR

- 5 What is non destructive testing? How ultrasonics are used in non destructive testing of materials?

UNIT - III

- 6 (a) Derive an expression for energy level of a particle in one dimensional potential well.
(b) What are the properties of matter waves?

OR

Discuss the motion of electron in a periodic potential.

UNIT - IV

- 8 (a) Obtain an expression for Hall coefficient.
(b) Explain the working of LED.

OR

- 9 (a) Explain soft and hard magnetic materials.
(b) A magnetic material has a magnetization of 3300 A/m and flux density of 0.0044 Wb/m^2 . Calculate magnetizing force and the relative permeability of the material.

UNIT - V

- 10 (a) Prove that superconductor is a very good diamagnetic material.
b) (Explain BCS theory of superconductors.

OR

- 11 (a) How the optical and magnetic properties change during the transition from bulk to nano?
(b) Write application of nanomaterials.
