Code: 13A56101

R13

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)
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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 A^0. The diameter of 10th 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

7   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.

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