

Code: 13A56101

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)
- What is an optical resonator?
  - What is meant by total internal reflection?
  - What is Schottky defect?
  - What is Piezoelectricity?
  - What is Hiesenberg's uncertainty principle?
  - What are the sources of electrical resistance?
  - What is the direct band-gap semiconductor?
  - Define hysteresis.
  - What is flux quantization?
  - 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  $5900 \text{ \AA}$ . The diameter of  $10^{\text{th}}$  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

- 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  $3300 \text{ A/m}$  and flux density of  $0.0044 \text{ Wb/m}^2$ . 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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