

B.Tech I Year II Semester (R15) Regular & Supplementary Examinations May/June 2017

ENGINEERING PHYSICS

(Common to IT, ECE, EIE and ME)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- What do you understand by population inversion?
 - Explain the principle of optical fiber.
 - Define unit cell and space lattice.
 - Write any two applications of X-ray diffraction.
 - Write about matter waves.
 - What are the drawbacks of classical free electron theory?
 - Write any two applications of Hall effect.
 - Write the properties of Ferro magnetic materials.
 - Explain Meissner effect.
 - Give the physical significance of nanoscale.

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

- 2 (a) Explain how Newton's rings are formed in the reflected light. Derive an expression for diameter of bright ring.
(b) Newton's rings are observed in the reflected light of wavelength 5900 \AA . The diameter of 10th dark ring is 0.5 cm. Find the radius of curvature of lens used.

OR

- 3 (a) With the help of suitable diagram, explain the construction and working of He – Ne laser.
(b) Distinguish between Homo and Heterojunction semiconductor lasers.

UNIT – II

- 4 Show that FCC is the most closely packed of three cubic structures.

OR

- 5 Explain working and construction of Piezoelectric method of ultrasonic wave production.

UNIT – III

- 6 Show that the energies of a particle in a potential box are quantized.

OR

- 7 (a) Explain the origin of energy bands in solids.
(b) Distinguish between conductor, insulators and semiconductors.

UNIT – IV

- 8 (a) Write a note on drift and diffusion currents.
(b) Derive an expression for Einstein equation.

OR

- 9 What is Bohr magnetron? Explain the origin of magnetic moment in materials.

UNIT – V

- 10 (a) Write general properties of superconductors.
(b) Distinguish between type – I and type – II superconductors.

OR

- 11 (a) Describe the method of Top down and Bottom up approaches in nano material preparation.
(b) Write optical properties of nano materials.