

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

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

OR

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

UNIT – II

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

OR

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

UNIT – III

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

OR

- Explain the origin of energy bands in solids.
 - Distinguish between conductor, insulators and semiconductors.

UNIT – IV

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

OR

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

UNIT – V

- Write general properties of superconductors.
 - Distinguish between type – I and type – II superconductors.

OR

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