Code No: 121AD

R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year Examinations, June - 2022
ENGINEERING PHYSICS
(Common to CE, EEE, ME, ECE, CSE, IT, AME, MIE, PTM)

Time: 3 Hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
- - -

1.a) Explain the different types of bonding in solids with suitable examples.
b) Describe in detail the structure of NaCl. [9+6]

2.a) Explain various types of point defects with neat diagrams.
b) A substance with the FCC lattice has density 6200 kg/m^3 and molecular weight 60.2. Calculate the lattice constant. (Given Avogadro number is 6.02×10^{26}/kg.mol). [10+5]

3.a) What are the basic postulates of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics? Write energy distribution equations for all three statistics.
b) Explain the physical significance of wave function. [10+5]

4.a) Discuss in detail the differences between Hard and Soft magnetic materials.
b) What are the Type-I and Type-II superconductors? Explain in detail. [7+8]

5.a) What is double refraction? Explain construction and working of Nicol's prism.
b) Describe in detail construction and working principle of Ruby laser. [9+6]

6.a) Derive an expression for charge carrier concentration of holes in P-type semiconductor.
b) A copper strip 2.0 cm wide and 1.0 mm thick is placed in a magnetic field with B=1.5wb/m^2. If a current of 200 A is setup in the strip, calculate Hall voltage that appears across the strip. Assume $R_H = 6 \times 10^{-7}$ m^3/C. [9+6]

7.a) What are the various factors affecting architectural acoustics and their remedies.
b) Describe the Chemical Vapor Deposition (CVD) technique. [10+5]

8.a) Describe Davison and Germer's experiment and explain how it enabled the verification of wave nature of matter.
b) Derive the Clausius-Mossotti relation. [9+6]

--ooOoo--