

Assignment
Bsc Physical Science-VI SEM
Solid-State Physics
2023-24

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M.M- 30 marks

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Q1. (a) Drive the primitive translational vectors of hexagonal lattice.

(b) What do miller indices signify. Draw the lattice planes (121), (211), (111) in a crystal with cubic unit cell.

(c) It is given that the primitive basis vectors of a lattice are

$$a = 5i, b = 5j \text{ and } c = \frac{5}{2}(i+j+k)$$

What is the Bravais lattice? Find the volume of conventional unit cell and primitive unit cell with the help of diagram.

Q2. (a) Discuss the structure of Diamond and Sodium chloride.

(b) The Debye temperature for diamond is 2230°K. Calculate the highest possible vibrational frequency in diamond.

Q3. (a) Show that volume of reciprocal lattice is inversely proportional to that of direct lattice.

(b) Show that, for the closest packing of atoms, the densities of the FCC, BCC, SC and diamond monoatomic lattices are approximately in the ratio 1.4: 1.3: 1.0: 0.65.

