Assignment
Bsc (H) Physics-VI SEM
Solid-State Physics
2023-24

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Date: 05.09.23

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 and c= 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. In a cubic crystal, show that the first order reflection from (n00) planes is equivalent (mathematically) to the nth order reflection from (100) plane?

Q3. (a) Discuss the structure of Diamond and Sodium chloride.

(b) Calculate the glancing angle on the cube (100) of a rock salt crystal (a=2.84Å) corresponding to second order diffraction maximum for X-ray of wavelength 0.710Å.

 Q4. (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.