1.9. What type of solids are electrical conductors, malleable and ductile?
Ans: Metallic solids

1.10. Give the significance of a 'lattice point'.
Ans: Each lattice point represents one constituent particle of the solid. This constituent particle may be an atom, a molecule or an ion.

1.11. Name the parameters that characterise a unit cell.
Ans: A unit cell is characterized by following parameters:
(i) the dimensions of unit cell along three edges: a, b and c.
(ii) the angles between the edges: α (between b and c); β (between a and c) and γ (between a and b)

1.12. Distinguish between
(i) Hexagonal and monoclinic unit cells
(ii) Face-centred and end-centred unit cells.
Ans: (i)

Hexagonal unit cell	Monoclinic unit cell
a=b≠c	a≠b≠c
α = β = 90°	α = γ = 90°
γ = 120°	β ≠ 90°

(ii)

Face-centred unit cell	End-centred unit cell
A Face-centred unit cell the constituent particles are present at the corners and one at the centre of each face.	An End-centred unit cell contains particles at the corners and one at the centre of any two opposite faces.
Total no of particles in a face centered unit cell= 4	Total no. of particles in an end centered unit cell = 2

1.13. Explain how much portion of an atom located at
(i) corner and
(ii) body centre of a cubic unit cell is part of its neighbouring unit cell.
Ans:
(i) An atom at the comer is shared by eight adjacent unit cells. Hence, portion of the atom at the comer that belongs to one unit cell=1/8.
(ii) An atom at the body centre is not shared by any other unit cell. Hence, it belongs fully io unit cell.

1.14. What is the two dimensional coordination number of a molecule in square close-packed layer?
Ans: In 2D, square close packed layer, an atom touches 4 nearest neighbouring atoms. Hence, its CN=4

1.15. A compound forms hexagonal close-packed . structure. What is the total number of voids in 0. 5 mol of it? How many of these are

tetrahedral voids?
Ans:
No. of atoms in close packings 0.5 mol =0.5 x 6.022 x 10^{23} =3.011 x 10^{23}
No. of octahedral voids = No. of atoms in packing =3.011 x 10^{23}
No. of tetrahedral voids = 2 x No. of atoms in packing
= 2 x 3.011 x 10^{23} = 6.022 x 10^{23}
Total no. of voids = 3.011 x 10^{23} + 6.022 x 10^{23}
= 9.033 x 10^{23}

1.16. A compound is formed by two elements M and N. The element N forms ccp and atoms of M occupy l/3rd of tetrahedral voids. What is the formula of the compound?
Ans:
Atoms of N form ccp, therefore, if the lattice points are n, then
No . of atoms of N = n
No. of oct voids = n
No. of td voids = 2n= 2 x 1n/3 = 2n/3
∴ Formula of compound is: M : N
2/3 n : n
2n : 3n
2 : 3
i.e., M_2N_3

********** END **********