1. Define lattice points?

Lattice points: a. imaginary points b. used to designate the position of atoms in the crystal

c. Every lattice point has the same environment.

2. Define the terms a. Effective number b. Coordination number

a. Effective number: The total numbers of atoms present in or shared by a unit cell is known as effective number (or) number of atoms per unit cell.

b. Co-ordination number: It is the number of nearest neighbouring atoms to a particular atom.

3.Define atomic radius.

Atomic radius is defined as half the distance between the nearest neighbouring atoms in a crystal.

4. Define Unit cell.

It is the smallest geometry, the repetition of these small structures in three dimensions gives the complete crystal structure.

5. What is meant by crystal structure?

A crystal structure is obtained by combining a space lattice with a basis. The basis provides the number of atoms per lattice point, their types, mutual orientations and distances of separation.

6. Define primitive cell and non-primitive cell.

Primitive cell: If the total number of atoms present in a unit cell is one, it is called primitive.

Eg: simple cubic.

Non-primitive cell: If the total number of atoms present in a unit cell is more than one,it is called nonprimitive.

Eg: BCC, FCC

20.What is basis?

These are atoms or molecules and can be easily identified by using the lattice points.

Level - II

15. Define crystal.

Crystal is a solid whose constituent atoms or molecules are arranged in a definite geometrical form.

16. Distinguish crystalline and non-crystalline solids.

In crystalline each atom is at regular intervals along arrays in all directions of the crystal. But amorphous solids have no regular structure and also have no directional properties.

17. What are lattice parameters?

To represent a lattice the intercepts (a, b, and c) and three interfacial angles (α, β and γ) are essential. These six parameters (a. b. c and α, β, γ) are said to be lattice parameters.

8. What are Bravais lattice?

According to Bravais, there are fourteen possible independent ways of arranging points in three dimensional Spaces. These fourteen possible space lattices of seven crystal systems are called Bravais Lattices.

9. Name the seven crystal systems.

The seven crystal systems are

1. Cubic

2. Tetragonal

3. Orthorhombic

4. Monoclinic

5. Triclinic

6. Trigonal

7. Hexagonal

19. Define Atomic packing factor:

It is the ratio of total volume occupied by number of atoms per unit cell to the total volume of the unit cell.

$$APF = \frac{\text{Total number of atoms per unit cell X Volume of one atom}}{\text{Total volume of the unit cell (V)}}$$

18. Give the relation between interplanar spacing and lattice constant.

The interplanar spacing $d = a/\sqrt{(h2+k^2+l^2)}$. Where a is lattice constant and (h k l) is the miller indices.

Level – III

10. What are miller indices?

In a crystal orientation of planes or faces can be described interms of their intercepts on the three crystallographic axes. Miller suggested a method of indicating the orientation of a plane by reducing the reciprocal of the intercepts into smallest whole numbers.These indices are calle Miller Indices generally represented by (h k l).

11. Define inter planar spacing (d) in a cubic lattice.

In cubic systems the interplanar spacing is defined as the distance between adjacent planes (h k l) which can assist in determining crystal structures.

12. Write any two properties of graphites?

1. Graphite is a good conductor of heat and electricity.

2. Specific gravity of graphite is 2.3.

13. Explain Diamond cubic structure.

The diamond lattice consists of two interpenetrating face centered cubic Bravais lattices

displaced along the body diagonal of the cubic cell by one quarter the length of the diagonal. It can be regarded as a face centered cubic lattice with two points basis (0,0,0) and ((a/4,a/4,a/4).

14. Write any two applications of graphites?

1. The major use of graphite is in making lead pencils of different hardness

2. It is used to make electrodes.

7. Define Polymorphism and allotropy.

Polymorphism: A substance that can exist in two or more forms in the same state is called polymorphism

Allotropy: An element that can exist in two or more forms in the same state is called allotropy