PARISHRAM PUBLICATIONS
PUNE

NAME of Students :- _____

Chemistry :- Solid State

Class : XII **Total Marks :-**

1. Which one has highest melting point?
(a) Ionic crystal (b) Molecular crystal
(c) Covalent crystal (d) Metallic crystal

2. In crystal lattice formed by bcc unit cell the void volume is
(a) 68% (b) 74%
(c) 32% (d) 26

3. The coordination number of atoms in bcc crystal lattice is
(a) 2 (b) 4
(c) 6 (d) 8

4. Which of the following is not correct?
(a) Four spheres are involved in the formation of tetrahedral void.
(b) The centres of spheres in octahedral voids are at the apices of a regular tetrahedron.
(c) If the number of atoms is N the number of octahedral voids is 2N.
(d) If the number of atoms is N/2, the number of tetrahedral voids is N.

5. A compound forms hcp structure. Number of octahedral and tetrhedral voids in 0.5 mole of substance is respectively
(a) 3.011×10^{23}, 6.022×10^{23}
(b) 6.022×10^{23}, 3.011×10^{23}
(c) 4.011×10^{23}, 2.011×10^{23}
(d) 6.011×10^{23}, 12.022×10^{23}

6. A group IV A element with a density 11.35 g/cm³ crystallizes in a fcc lattice whose unit cell edge length is 495 pm. Calculate its atomic mass.
(a) 207.2 g/mol (b) 180 g/mol
(c) 109.9 g/mol (d) 280.8 g/mol

7. If Z is the number of atoms in the unit cell that represents the closed packing sequence ABCABC…, the number of tetrahedral voids in the unit cell is equal to
(a) Z (b) 2Z
(c) Z/2 (d) Z/4

8. Ice crystalizes in a hexagonal lattice having volume of the unit cell as 132×10^{-24} cm³. If density is 0.92 g/cm³ at a given temperature, then number of H_2O molecules per unit cell.
(a) 1 (b) 2
(c) 3 (d) 4

9. In a compound, atoms of elements Y form ccp lattice and those of the elements of X occupy two-third tetrahedral voids. The formula of the compound will be-
(a) X_3Y_4 (b) X_4Y_3
(c) X_2Y_3 (d) X_2Y

10. The following is not a function of an impurity present in a crystal
(a) Contributing to scattering
(b) Having a tendency to diffuse
(c) Establishing thermal equilibrium
(d) Introducing new electronic energy levels

11. An example of a non-stoichiometric compound is
(a) Al_2O_3 (b) NiO_2
(c) Fe_3O_4 (d) PbO

12. F-centers in an ionic crystal are
(a) Lattice sites containing electrons
(b) Interstitial sites containing electrons
(c) Lattice sites that are vacant
(d) Interstitial sites containing cations

13. Which defect causes decrease in the density of crystal
(a) Frenkel (b) interstitial
(c) Schottky (d) F-center

14. The number of octahedral sites per sphere in a fcc structure is
(a) 2 (b) 4
(c) 1 (d) 8

15. The arrangement ABCABC……. Is referred as
(a) Cubic close packing
(b) Hexagonal close packing
(c) Tetragonal close packing
(d) Octahedral close packing

16. The simple cubic structure has which type of layering.
(a) ABAB… type (b) AAAA…. Type
(c) ABCABC… type (d) None of these

17. The number of octahedral and tetrahedral sites in a cubical close packed array of N spheres respectively is-
(a) N and 2N (b) N/2 and N
(c) 2N and N (d) 4N and 2N

18. Molecular solids are
(a) crystalline solids (b) amorphous solids
(c) ionic solids (d) metallic solids

19. Which of the following is n-type semiconductor?
(a) Pure Si (b) Si doped with As
(c) Si doped with Ga (d) Ge doped with In

20. In Frenkel defect
(a) electrical neutrality of the substance is changed.
(b) density of the substance is changed.
(c) both cation and anion are missing
(d) overall electrical neutrality is preserved.

21. Pb has fcc structure with edge length of unit cell 495 pm. Radius of Pb atom is
(a) 205 pm (b) 185 pm
(c) 260 pm (d) 175 pm

22. Which one of the following is a primitive unit cell?
(a) Simple cubic (b) Body-centered cubic
(c) Face-centered cubic
(d) Both body-centered and face-centered cubic

23. The number of atoms present in a unit cell of a monoatomic substance of simple cubic lattice is
(a) 1 (b) 2
(c) 3 (d) 6

24. Which of the following type of cubic lattice has maximum number of atoms per unit cell?
(a) Simple cubic (b) Body centered cubic
(c) Face centered cubic (d) All have same

25. Which of the following is a Bravais crystal system:
(a) Tetragonal (b) Triclinic
(c) Monoclinic (d) All the above

26. In graphite, carbon atoms are joined together due to
(a) Covalent bonding (b) Vanderwaal forces
(c) Metallic bonding (d) Ionic bonding

27. Under which category iodine crystals are placed among the following:
(a) Ionic crystal (b) Metallic crystal
(c) Covalent crystal (d) Molecular crystal

28. An example of a substance possessing giant covalent structure is:
(a) Iodine crystal (b) Silica
(c) Solid carbon dioxide (d) White phosphorus

29. Bravais lattices are of
(a) 10 types (b) 8 types
(c) 14 types (d) 7 types

30. Frenkel defect is generally observed in
(a) AgBr (b) AgI
(c) ZnS (d) All of these

31. In stoichiometric defects the ratio of positive and negative ions as indicated by chemical formula of the compound:
(a) Decreases (b) Increases
(c) Remains same (d) Cannot be predicted

32. To get n-type doped semi-conductor, impurity to be added to silicon should have the following number of valence electrons?
(a) 2 (b) 5
(c) 3 (d) 1

33. The fraction of total volume occupied by atoms in a simple cubic is-
(a) $\pi/2$ (b) $\sqrt{3}\,\pi/8$
(c) $\sqrt{2}\,\pi/6$ (d) $\pi/6$

34. In a metal oxide, the oxide ions are arranged in hexagonal close packing and metal ions occupy two-third of the octahedral voids. The formula of the oxide is-
(a) MO (b) M_2O_3
(c) MO_2 (d) M_2O

35. Copper crystallizes in a face-centered cubic lattice with a unit cell length of 361pm. What is the radius of copper atom in pm?
(a) 157 (b) 181
(c) 108 (d) 128

36. Which arrangement of electron describes ferrimagnetism
(a) All electrons aligned in one direction
(b) Equal electrons aligned in opposite direction
(c) Unequal electrons aligned in opposite direction
(d) None of the above

37. A semi-conductor of Ge can be made p-type by adding
(a) Trivalent Impurity (b) Tetravalent Impurity.
(c) Pentavalent Impurity (d) Divalent Impurity.

38. Valence band and conduction band in semi-conductors are
(a) Half-filled (b) Overlapping
(c) Small Energy gap (d) Large Energy gap

39. In stoichiometric defects the ratio of positive and negative ions as indicated by chemical formula of the compound:
(a) Decreases (b) Increases
(c) Remains same (d) Cannot be predicted

40. Amorphous substances show
(A) Short and long range order
(B) Short range order
(C) Long range order
(D) have no sharp melting point
(a) A and C are correct (b) B and C are correct

(c) C and D are correct (d) B and D are correct

41. Which one is an example of amorphous solid:
(a) Calcium fluoride (b) Salt
(c) Cesium chloride (d) Glass

42. What is the formula to find the density of unit cell?
(a) $Z \times M \times d = a^3 \times N_A$ (b) $d = Z \times M \times a^3 \times N_A$
(c) $d \times N_A \times a^3 = Z \times M$ (d) $Z \times N_A = d \times a^3 \times M$

43. Schottky defect in crystals is observed when
(a) Unequal number of cations and anions are missing from the lattice
(b) Equal number of cations and anions are missing
(c) An ion leaves its normal site and occupies an interstitial site
(d) Density of the crystal is increased

44. Select a ferromagnetic material from the following.
(a) Dioxygen (b) Chromium (IV) oxide
(c) Benzene (d) Dihydrogen monoxide

45. In a crystal, the atoms are located at the position of
(a) maximum potential energy
(b) minimum potential energy
(c) zero potential energy
(d) infinite potential energy

46. Suppose the mass of a single Ag atom is 'm'. Ag metal crystallizes in fcc lattice with unit cell of length 'a'. The density of Ag metal in terms of 'a' and 'm' is
(a) $\frac{4m}{a^3}$ (b) $\frac{2m}{a^3}$
(c) $\frac{m}{a^3}$ (d) $\frac{m}{4a^3}$

47. Volume occupied by single CsCl ion pair in a crystal is 7.104×10^{-23} cm^3. The smallest Cs – Cs internuclear distance is equal to length of the side of the cube corresponding to volume of one CsCl ion pair. The smallest Cs to Cs internuclear distance is nearly
(a) 4.4 Å (b) 4.3 Å
(c) 4 Å (d) 4.5 Å

48. A crystalline solid XY3 has ccp arrangement for its element Y. X occupies
(a) 66% of tetrahedral voids
(b) 33% of tetrahedral voids
(c) 66% of octahedral voids
(d) 33% of octahedral voids

49. Which metal among the following has the highest packing efficiency ?
(a) Iron (b) Tungsten
(c) Aluminium (d) Polonium

50. The number of unit cells in 58.5 g of NaCl is nearly
(a) 6×10^{20} (b) 3×10^{22}
(c) 1.5×10^{23} (d) 0.5×10^{24}