

- Q.1 Which of the following is not a crystalline solid ?  
(1) Common (2) Sugar  
(3) iron (4) Rubber
- Q.2 A pseudo solid is :  
(1) glass  
(2) pitch  
(3) KCl  
(4) Glass and pitch both
- Q.3 Wax is an example of,  
(1) Ionic crystal (2) Covalent crystal  
(3) Molecular crystal (4) Metallic crystal
- Q.4 A molecular crystalline solid,  
(1) is very hard  
(2) is volatile  
(3) has a high melting point  
(4) is a good
- Q.5  $a \neq b \neq c, \alpha \neq \beta \neq \gamma \neq 90^\circ$  represents  
(1) tetragonal system  
(2) orthorhombic system  
(3) monoclinic system  
(4) triclinic system
- Q.6 Bravais lattices are of,  
(1) Cubic (2) Hexagonal  
(3) Triclinic (4) Orthorhombic
- Q.7 In a face centred cubic cell, an atom at the corner contributes to the unit cell,  
(1) 1 part (2) 1/2 parts  
(3) 1/4 parts (4) 1/8 parts
- Q.8 A compound having bcc geometry has atomic mass 50. Calculate the density of the unit cell, if its edge length is 290 pm.  
(1)  $6.81 \text{ g cm}^{-3}$  (2)  $3.40 \text{ g cm}^{-3}$   
(3)  $13.62 \text{ g cm}^{-3}$  (4) None of these.
- Q.9 An element crystallises in BCC structure. The edge length of its unit cell is 288 pm. If the density of the crystal is  $7.2 \text{ g cm}^{-3}$ , what is the atomic mass of the element ?  
(1) 51.8 (2) 103.6  
(3) 25.9 (4) 207.2
- Q.10 The compound CuCl has ZnS (ccp) structure. Its density is  $3.4 \text{ g cm}^{-3}$ . What is the length of the edge of the unit cell ?  
(1) 5.78 cm (2) 578 pm  
(3) 578 m (4)  $193.3 \times 10^{-24}$
- Q.11 The number of atomic in 100g of an FCC crystal with density  $d = 10 \text{ g cm}^{-3}$  and cell edge as 200 pm is equal to  
(1)  $3 \times 10^{25}$  (2)  $0.5 \times 10^{25}$   
(3)  $1 \times 10^{25}$  (4)  $2 \times 10^{25}$
- Q.12 The available space occupied by spheres of equal size in three dimension in both hcp and ccp arrangement is  
(1) 74% (2) 70%  
(3) 60.4% (4) 52.4%
- Q.13 Which of the following has hcp structure ?  
(1) Al (2) Mg  
(3) Cu (4) Ni
- Q.14 If the coordination number of an element in its crystal lattice is 8, then packing is :  
(1) fcc  
(2) hcp  
(3) bcc  
(4) None of the above

- Q.15 A tetrahedral void in a crystal implies that,  
 (1) shape of the void is tetrahedral  
 (2) molecules forming the void are tetrahedral in shape  
 (3) the void is surrounded tetrahedrally by four spheres  
 (4) the void is surrounded by six spheres
- Q.16 In a closest packed lattice, the number of octahedral sites as compared to tetrahedral ones will be  
 (1) Equal (2) Half  
 (3) Double (4) None of these
- Q.17 The limiting radius ratio for tetrahedral shape is  
 (1) 0 to 0.155 (2) 0.155 to 0.225  
 (3) 0.225 to 0.414 (4) 0.414 to 0.732
- Q.18 Which one of the following statements is incorrect about rock salt type ?  
 (1) It has fcc arrangement of  $Cl^-$   
 (2)  $Na^+$  and  $Cl^-$  ions have a co-ordination number of 6 : 6  
 (3) A unit cell of NaCl consists of four NaCl units  
 (4) All halides of alkali metals have rock-salt type structure
- Q.19 Each unit cell of NaCl consists of 14  $Cl^-$  ions and,  
 (1) 13  $Na^+$  (2) 14  $Na^+$   
 (3) 6  $Na^+$  (4) All are wrong
- Q.20 The co-ordination number of  $Cs^+$  and  $Cl^-$  ions in CsCl structure is :  
 (1) 4 : 4 (2) 6 : 6  
 (3) 8 : 8 (4) 4 : 8
- Q.21 The 8 : 8 type of packing is present in  
 (1) NaCl (2) KCl  
 (3) CsCl (4)  $MgF_2$
- Q.22 A compound formed by elements by X and Y crystallizes in a cubic structure in which the X atom are at the corners of a cube and the Y atom are at the face-centres. The formula of the compound is  
 (1)  $X_3Y$  (2) XY  
 (3)  $XY_2$  (4)  $XY_3$
- Q.23 If 'Z' is the number of atom in the unit cell that represents the closest packing sequence ---A B C A B C ---, the number of tetrahedral voids in the unit cell is equal to  
 (1) Z (2) 2Z  
 (3) Z/2 (4) Z/4
- Q.24 Density of Li atom is  $0.53 \text{ g cm}^{-3}$ . The edge length of Li is 3.5 Å. Find out the number of Li atoms in an unit cell. ( $N_A = 6.023 \times 10^{23}$ ), ( $M = 6.94 \text{ g mol}^{-1}$ )  
 (1) 2 (2) 8  
 (3) 4 (4) 6
- q.25 The  $Ca^{2+}$  and  $F^-$  are located in  $CaF_2$  crystal, respectively at face centred cubic lattice points and in -  
 (1) Tetrahedral voids  
 (2) Half of tetrahedral voids  
 (3) Octahedral voids  
 (4) half of octahedral voids
- Q.26 If 'a' stands for the edge length of the cubic system : simple cubic, body centred cubic and face centred cubic, then the ratio of radii of the spheres in these system will be respectively.  
 (1)  $\frac{1}{2}a, \sqrt{3}a : \frac{1}{\sqrt{2}}a$   
 (2)  $\frac{1}{2}a : \frac{\sqrt{3}}{2}a : \frac{\sqrt{2}}{2}a$   
 (3)  $1a : \sqrt{3}a : \sqrt{2}a$   
 (4)  $\frac{1}{2}a : \frac{\sqrt{3}}{2}a : \frac{\sqrt{2}}{2}a$

- Q.27 Lithium metal crystallises in a body centred cubic crystal. If the length of the side of the unit cell of lithium is 351 pm, the atomic radius of the lithium will be :-
- (1) 300.5 pm                      (2) 240.8 pm  
 (3) 151.8 pm                      (4) 75.5 pm
- Q.28 AB crystallizes in a centred cubic lattice with edge length 'a' equal to 387 pm. The distance between two oppositely charged ions in the lattice is :-
- (1) 300 pm                      (2) 335 pm  
 (3) 250 pm                      (4) 200 pm
- Q.29 Structure of a mixed oxide is cubic close-packed (c.c.p). The cubic unit cell mixed oxide is composed of oxide ions. One fourth of the tetrahedral voids are occupied by divalent metal A and the octahedral voids are occupied by a monovalent metal B. The formula of the oxide is :
- (1)  $A_2B_3O_4$                       (2)  $AB_2O_2$   
 (3)  $BOA_2$                       (4)  $A_2BO_2$
- Q.30 In a face centred cubic lattice, atom A occupies the corner positions and atom B occupies the face centre positions. If one atom of B is missing from one of the face centred points, the formula of the compound is :-
- (1)  $A_2B_3$                       (2)  $A_2B_5$   
 (3)  $A_2B$                       (4)  $AB_2$
- Q.31 The edge length of a face centered cubic cell of an ionic substance is 508 pm. If the radius of the cation is 110 pm, the radius of the anion is :-
- (1) 144 pm                      (2) 288 pm  
 (3) 398 pm                      (4) 618 pm
- Q.32 In a compound, atoms of element Y from ccp lattice and those of element X occupy  $\frac{2}{3}$ rd of tetrahedral voids. The formula of the compound will be -
- (1)  $X_4Y_3$                       (2)  $X_2Y_3$   
 (3)  $X_2Y$                       (4)  $X_3Y_4$
- Q.33 An ionic compound has a unit cell consisting of A ions at the corners of a cube and B ions the centres of the faces of the cube. The empirical formula of this compound would be-
- (1)  $A_2B$                       (2) AB  
 (3)  $A_3B$                       (4)  $AB_3$
- Q.34 How many unit cells are present in a cube-shaped ideal crystal of NaCl of mass 1.00g ?
- (1)  $1.28 \times 10^{21}$  units cells  
 (2)  $1.71 \times 10^{21}$  units cells  
 (3)  $2.57 \times 10^{21}$  units cells  
 (4)  $5.14 \times 10^{21}$  units cells
- Q.35 The no. of per unit cell in B.C.C & F.C.C. is respectively :
- (1) 8, 10                      (2) 2, 4  
 (3) 1, 2                      (4) 1, 3