



CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

SOLIDS STATE

Problems

1. How is crystalline solid different from an amorphous solid?



Watch Video Solution

2. Compare the metallic bond strengths in Mg , Ca and Al .



Watch Video Solution

3. Amorphous solids have unit cells in them. Comment.

 [Watch Video Solution](#)

4. What type of crystalline solid is boron nitride? Why? Sol : Boron nitride is an example of covalent crystal.

 [Watch Video Solution](#)

5. How many symmetry elements are there for a cubic structure or a crystal ?

 [Watch Video Solution](#)

6. How many carbon atoms are present in one unit cell of diamond ?

 [Watch Video Solution](#)

7. In a cubic structure, atoms of 'X' occupy the corners, atoms of 'Y' occupy the centre of the body and atoms of 'Z' occupy the centres of all six faces. Write the composition of the unit cell.



Watch Video Solution

8. Calculate the density of unit cell of sodium, if the edge length of cubic structure is $4.24\text{\AA}$.



Watch Video Solution

9. An alloy of copper and zinc solidifies in ccp structure, where copper occupies lattice points and zinc occupies 50% of the tetrahedral voids and all octahedral voids. Calculate the weight percentage of copper in the alloy.



Watch Video Solution

10. An X-ray beam ($\lambda = 70.9\text{pm}$) was scattered by a crystalline solid. The angle (2θ) of the diffraction for a second order reflection is 14.66° . Calculate the distance between parallel planes of atoms of the crystalline solid.



Watch Video Solution

11. The packing fraction of a simple cubic structure is $\pi/6$. Prove.



Watch Video Solution

12. What is the significance of resistance ratio, $\rho_{300k}/\rho_{4.2k}$?



Watch Video Solution

13. Sodium vapour is paramagnetic, but cations of sodium are diamagnetic, while vapour magnesium as well as cations of magnesium

are diamagnetic. Explain.



Watch Video Solution

14. Graphite is a non-metal, but its electrical behaviour is like metals. Explain.



Watch Video Solution

15. Write the conductivity order of aluminium phosphide, silicon and cadmium sulphide.



Watch Video Solution

16. NiO is antiferromagnetic. But on heating at $250^{\circ}C$, it becomes paramagnetic. Why?



Watch Video Solution

Subjective Exercise 1 Short Answer Questions

1. Write the main differences between crystalline



Watch Video Solution

2. solids and amorphous solids.



Watch Video Solution

3. Discuss the metallic bonding.



Watch Video Solution

4. What are ionic solids and covalent solids ? Write examples 4. Mention the forces that operate in molecular solids. Discuss.



Watch Video Solution

5. Do amorphous solids have unit cells in them.



[Watch Video Solution](#)

6. What do you know about "amorphous" substances ? Discuss ?



[Watch Video Solution](#)

Subjective Exercise 1 Very Short Answer Questions

1. What are anisotropy and isotropy ?



[Watch Video Solution](#)

2. Mention different examples of molecular solids.



[Watch Video Solution](#)

3. What will be the magnitude of the vapour pressure of ionic crystals ?



Watch Video Solution

4. What is the minimum radius ratio that can give a specific coordination number.



Watch Video Solution

Subjective Exercise 2 Short Answer Questions

1. Define (a) space lattice, (b) crystal lattice, (c) unit cell and (d) coordination number.



Watch Video Solution

2. Derive Bragg's equation .



[Watch Video Solution](#)

3. Discuss the close packing in crystal structures.



[Watch Video Solution](#)

4. What are the tetrahedral hole and octahedral hole ? How they are formed explain ?



[Watch Video Solution](#)

5. Explain when diffracted rays may have constructive and destructive interference,



[Watch Video Solution](#)

6. Derive a relation between the density of a crystalline substance and the unit cell length.



Watch Video Solution

7. Calculate the number of particles present in a fcc crystal structure.



Watch Video Solution

8. Place the atoms of an element 'A' in the lattice points of Face centred cubic structure.



Watch Video Solution

9. How many lattice points are there in a unit cell of a (a) B.C.C lattice (b) End centred lattice



Watch Video Solution

10. Draw the points of two dimensional lattice with sequence of unit cells.



Watch Video Solution

11. The diffracted X rays from $CuSO_4$ crystal are allowed to fall on a photographic plate. What happens to the photographic plate.



Watch Video Solution

12. A grating has 5.7×10^3 lines per cm. If X-rays of wavelength 546 nm are incident on the grating, find the angle of reflection for the first order diffraction maximum.



Watch Video Solution

13. Atomic weight of silver is 107.8. Silver crystallises in fcc lattice with edge length of unit cell is $4.086 \text{ \AA}$. Calculate the density of unit cell of silver and radius of silver atom.



Watch Video Solution

14. A bcc lattice is made up of two elements X and Y. Atoms of X occupy two corners and atoms of Y occupy the remaining lattice points. Derive the composition of the compound.



Watch Video Solution

15. The edge length of sodium chloride is $5.64 \text{ \AA}$. What is the density of sodium chloride?



Watch Video Solution

16. NH_4X crystallises in bcc lattice with edge length 383 pm. If the radius of NH_4^+ ion is $154 \pm$, calculate the radius of halide (X^-).



Watch Video Solution

17. Argon crystallises in a F.C.C lattice with 1 atom at each lattice point. If the unit cell length is $5.3114A^\circ$ at $0^\circ K$. Calculate nearest neighbour distance in A° at zero kelvin



Watch Video Solution

18. Calculate the contribution of lattice points in body centred lattice arrangement.



Watch Video Solution

19. A body centred cubic lattice is made up of two elements A and B. Atoms of 'A' occupy two corners of the cube. If the remaining position in the cell are occupied by atoms of 'B'. Suggest the formula of the compounds.



Watch Video Solution

20. An X-ray beam ($\lambda = 70.9\text{pm}$) was scattered by a crystalline solid. The angle (2θ) of the diffraction for a second order reflection is 14.66° . Calculate the distance between parallel planes of atoms of the crystalline solid.



Watch Video Solution

21. X-rays of wavelength equal to 0.134 nm give a first order diffraction from the surface of a - crystal when the value of θ is 10.5° , then the

distance between the adjacent planes in the crystal is
($\sin 10.5^\circ = 0.1822$)



[Watch Video Solution](#)

22. The density KBr cubic crystal is 2.75 g cm^{-3} with an edge length of cube 654 pm. How many mass points are present in the unit cell ?



[Watch Video Solution](#)

23. Density of silver is 10.5 g cm^{-3} Calculate the edge length of the unit cell of silver.



[Watch Video Solution](#)

24. A crystal was examined with X - rays of wave length $1.53 \text{ \AA}$ with a maximum reflection at $15^\circ 36'$. What is the interplanar spacing ? If X - rays of wave length $2.29 \text{ \AA}$ was used, what will be angle of reflection?



[Watch Video Solution](#)

25. The interplanar distance in a crystal used for X-ray diffraction is $2A^{\circ}$. The angle of incidence for first order diffraction is 9° , what is the wavelength of X-rays ?



[Watch Video Solution](#)

26. An alkali metal crystallises in bcc lattice. What is the radius of an atom of the metal ?



[Watch Video Solution](#)

27. An alloy is made up of metals X and Y. Atoms of X are in ccp arrangement. Atoms of Y occupy half of the tetrahedral and all octahedral voids. Write the composition of the alloy. XY_2



[Watch Video Solution](#)

28. A compound of two elements P and Q crystallises in cubic structure. If P occupies corners and occupies face centres, what is the composition of the compound ? If atoms of Q along with one direction are removed, what is the composition ?



Watch Video Solution

29. An alloy of Au and Cu crystallises with atoms of an occupying all lattice points at the corner's of cubic and atoms of Cu occupying the centres of all faces. Write the empirical formula of the alloy.



Watch Video Solution

30. Unit cell of silver (at wt. 108) has a density 10.5 gcc^{-1} . The crystal is cubic with edge length $4.09 \text{ \AA}$. How many silver atoms are present in unit cell of the metal ?



Watch Video Solution

31. In a close packed structure of mixed oxide, the lattice is composed of O^{2-} ions. One eighth of tetrahedral voids are occupied by divalent cations A^{2+} and one half of octahedral voids by trivalent cations B^{3+}

What is the formula of oxide ?



[Watch Video Solution](#)

32. Silicon crystallises in fcc lattice, a single crystal of high purity like diamond. Gram atomic weight of silicon is 28 g mol^{-1} . Edge length of unit cell is 0.357 nm . Calculate the number of silicon atoms per unit cell and density of unit cell.



[Watch Video Solution](#)

33. Metallic chromium crystallises in bcc lattice. The edge length of unit cell is $2.87 \text{ \AA}$. Calculate (a) atomic radius and (b) density.

[Watch Video Solution](#)

34. A metal crystallises in fcc lattice with edge length of unit cell $3.5\text{\AA}$ and also in bcc lattice with edge length of unit cell $3\text{\AA}$. Calculate the ratio of the densities of fcc and bcc lattices.

[Watch Video Solution](#)

35. For a cubic lattice edge length of unit cell is $5\text{\AA}$ and density is 2gcm^{-3} . Calculate the radius of an atom, if gram atomic weight is 75gmol^{-1}

[Watch Video Solution](#)

36. In a compound XY, the ionic radii of X^{+} and Y^{-} are 88 pm and 200 pm respectively. Write the coordination number of X^{+}

[Watch Video Solution](#)

37. An element crystallises in the fcc lattice having edge length 400 pm. Calculate the maximum diameter which can be placed in interstitial sites without disturbing the structure.



Watch Video Solution

38. Calculate the wavelength of X-rays which produces a first order diffraction angle 2θ equal to 16.8° for a crystal. Inter particle distance of crystal is 200 pm.



Watch Video Solution

39. X rays of wavelength $\lambda = 0.134\text{nm}$. Gave a first order diffraction from the surface of the crystal value was found to be 10.5° , calculate the distance between the plane in the crystal.



Watch Video Solution

40. 'Al' crystallises unit F.C.C lattice. If the closest approach of Al atoms in the crystal is 0.4054nm . Find the density of Al'.



[Watch Video Solution](#)

Subjective Exercise 2 Very Short Answer Questions

1. Distinguish between square and hexagonal two dimensional packing of metal atoms



[Watch Video Solution](#)

2. How is the angle of reflection determined in Bragg's spectrometer method ?



[Watch Video Solution](#)

3. Name the parameters that characterise a unit cell .



Watch Video Solution

4. Give reasons for use of X rays in the study of solids.



Watch Video Solution

5. What sort of crystals are necessary in Bragg's method.



Watch Video Solution

6. What are the characteristics (a, b, c and α , β , γ) values in a tetragonal systems)



Watch Video Solution

7. Name an element that forms monoclinic crystals.



[Watch Video Solution](#)

8. What is the crystal structure of an orange coloured oxidising agent used in the lab.



[Watch Video Solution](#)

9. Graphite crystallizes in hexagonal solids. Give its characteristics.



[Watch Video Solution](#)

10. Which crystal structure has 12 as coordination number.



[Watch Video Solution](#)

11. How many unit cells share each of the following lattice points in a cubic lattice ?



Watch Video Solution

12. What relation holds good between the numbers of octahedral and tetrahedral holes in a lattice formed by spheres ?



Watch Video Solution

Subjective Exercise 3 Short Answer Questions

1. Distinguish between conductors, insulators and semiconductors.



Watch Video Solution

2. What are n-type and p-type semiconductors?



[Watch Video Solution](#)

3. Discuss on diamagnetism and paramagnetism with suitable examples.



[Watch Video Solution](#)

4. What are ferromagnetic, antiferromagnetic and ferrimagnetic substances?



[Watch Video Solution](#)

5. Explain different magnetic properties of solids. What happens when these substances are heated ?



[Watch Video Solution](#)

6. Discuss the band theory of solids, to account for their conductivity properties.



Watch Video Solution

7. How the elements of group 12, 13, 15 and 16 are used in order to get substances of electrical importance ?



Watch Video Solution

Subjective Exercise 3 Very Short Answer Questions

1. What are ferromagnetic materials ? Give examples. What happens to a ferromagnetic material at curie temperature ?



Watch Video Solution

2. Differentiate between intrinsic semiconductors and extrinsic semiconductors.



Watch Video Solution

3. What is ferrimagnetism?



Watch Video Solution

4. How is magnetic moment calculated ?



Watch Video Solution

5. Write the value of one Bohr magneton.



Watch Video Solution

Objective Exercise 1 Types Of Solids Of Crystal Structures

1. Which of the following is amorphous in nature?

- A. Quartz
- B. $CuSO_4 \cdot 5H_2O$
- C. Dry ice
- D. fused silica glass

Answer: 4



Watch Video Solution

2. Which of the following is covalent solid

- A. Fe
- B. Diamond
- C. NaCl

D. Cu

Answer: 2



Watch Video Solution

3. $NaCl$ is an example of

A. Ionic solid

B. Covalent solid

C. Metallic solid

D. Molecular solid

Answer: 1



View Text Solution

4. Which of the following melts below 298 k.

A. $NaCl_{(s)}$

B. $Si_{(s)}$

C. $Ar_{(s)}$

D. $Na_{(s)}$

Answer: 3



Watch Video Solution

5. For a covalent solid, the units which occupy lattice points are

A. Atoms

B. Ions

C. Molecules or atoms

D. Electrons

Answer: 1



Watch Video Solution

6. Which of the following does not give any diffraction bands with X-rays ?

A. $BaSO_4$

B. Graphite

C. diamod

D. Plastic

Answer: 4



Watch Video Solution

7. Which of the following is not a crystalline solid?

A. KCl

B. $CsCl$

C. Glass

D. Rhombic S

Answer: 3



Watch Video Solution

8. Covalent solid among the following is

A. solid Ar

B. MgO

C. Fe

D. BN

Answer: 4



Watch Video Solution

9. Among solids, the highest melting point is exhibited by

A. Amorphous solids

B. Ionic solids

C. Pseudo solids

D. Molecular solids

Answer: 2



Watch Video Solution

10. Which of the following is not a correct statement ?

A. Any material can be made amorphous by quenching its melt (or) freezing its vapour

B. The melt of an amorphous solid when slowly cooled it will become crystalline

C. Glass melt over a range of temperatures

D. Quartz has irregular chains of SiO_4 units.

Answer: 4



Watch Video Solution

- | | Column A | Column B |
|-----|---------------------|--------------------------|
| 11. | A) Glass | 1) Framework silica |
| | B) Quartz | 2) Malleable and ductile |
| | C) Metallic crystal | 3) Pseudo solid |

The correct match is

A.

A	B	C
1	3	2

B.

A	B	C
3	1	2

C.

A	B	C
2	1	3

D.

A	B	C
1	2	3

Answer: 2



Watch Video Solution

12. (A) : Crystalline solids have sharp and characteristic melting points.

(R) : Crystalline solids have definite heat of fusion.

A. Both (A) and (R) are true. (R) properly explain (A)

B. Both (A) and (R) are true. (R) does not explain (A)

C. (A) is true. (R) is false

D. (A) is false. (R) is true

Answer: 2



Watch Video Solution

13. The maximum displacement perpendicular to the motion of the wave is known as

A. wavelength

B. intensity

C. amplitude

D. frequency

Answer: 3



Watch Video Solution

14. By passing X-rays through copper sulphate crystals diffraction band is obtained. It was first observed by

A. Max Van Laue

B. W.L Bragg

C. W.H. Bragg

D. W.L.Bragg & W.H.Bragg

Answer: 1



Watch Video Solution

15. The structural unit of a crystal is called

- A. unit cell
- B. crystal lattice
- C. space lattice
- D. structural motif

Answer: 4



Watch Video Solution

16. (A): Glass possess sharp melting point.

(R) : Glass is a pseudo solid

- A. Both (A) and (R) are true. (R) properly explain (A)
- B. Both (A) and (R) are true. (R) does not explain (A)
- C. (A) is true. (R) is false
- D. (A) is false. (R) is true

Answer: 4



Watch Video Solution

17. The angle corresponding to maximum diffraction of x-rays on solid crystal is determined by electrometre reading in

- A. Bragg's equation
- B. Powder method
- C. Debye- Hull method
- D. Max Von Laue experment

Answer: 1



Watch Video Solution

18. Number of space lattices presnt in triclinic System

A. four

B. three

C. two

D. one

Answer: 4



Watch Video Solution

19. Graphically the total number of fundamental spatial arrangements possible are

A. 3

B. 7

C. 10

D. 4

Answer: 4



[Watch Video Solution](#)

20. In case of a cubic system, the number of types of space lattices

- A. 3
- B. 7
- C. 14
- D. 12

Answer: 1



[Watch Video Solution](#)

21. The number of points at the centre of the primitive unit cell is

- A. 1
- B. 0

C. 2

D. 3

Answer: 2



Watch Video Solution

22. How many kinds of primitive unit cells are possible

A. 23

B. 7

C. 230

D. 14

Answer: 2



Watch Video Solution

- (Unitcell) (no of atoms per unitcell)
23. A) Simple cube 1) 4
B) fcc 2) 2
C) bcc 3) 1

The correct match is

A. $\begin{matrix} A & B & C \\ 2 & 3 & 1 \end{matrix}$

B. $\begin{matrix} A & B & C \\ 2 & 1 & 3 \end{matrix}$

C. $\begin{matrix} A & B & C \\ 3 & 1 & 2 \end{matrix}$

D. $\begin{matrix} A & B & C \\ 1 & 2 & 3 \end{matrix}$

Answer: C



Watch Video Solution

24. The number of space lattices possible for the crystallographic dimensions $\alpha \neq \beta \neq \gamma$

A. 1

B. 2

C. 3

D. 4

Answer: A



Watch Video Solution

25. In which of the following crystal systems F.C.C unit cells exists ?

A. Cubic, hexagonal

B. Tetragonal, orthorhombic

C. Orthorhombic, cubic

D. Triclinic, monoclinic

Answer: C



Watch Video Solution

26. Out of seven crystal systems how many have body centred unit cell ?

A. 4

B. 3

C. 2

D. 7

Answer: B



Watch Video Solution

27. How many unit cells are possible for the crystallographic dimensions

as $a \neq b \neq c$, $\alpha = \gamma = 90^\circ$, $\alpha \neq \beta$

A. 1

B. 2

C. 3

D. 4

Answer: B



Watch Video Solution

28. Which of the following systems is not correctly characterised ?

A. cubic : $a = b = c, \alpha = \beta = \gamma = 90^\circ$

B. tetragonal : $a = b \neq c, \alpha = \beta = \gamma = 90^\circ$

C. orthorhombic : $a \neq b \neq c, \alpha = \beta = \gamma = 90^\circ$

D. rhombohedral : $a = b \neq c: \alpha = \beta = \gamma = 90^\circ$

Answer: D



Watch Video Solution

29. Axial distances are $a = b \neq c$ and axial angles are $\alpha = 90^\circ = \beta, \gamma = 120^\circ$ in the system

- A. hexagonal
- B. tetragonal
- C. cubic
- D. monoclinic

Answer: A



Watch Video Solution

30. Total number of Bravais lattices is

- A. 3
- B. 7
- C. 10

D. 4

Answer: C



View Text Solution

31. (A): Crystalline solids are anisotropic

(R): Crystalline solids are not as closely packed as amorphous solids.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true Close packed structures and voids

Answer: C



Watch Video Solution

1. Which of the following has hcp crystal structure ?

A. NaCl

B. CaCl_2

C. Zn

D. RbCl

Answer: C



Watch Video Solution

- | | List I | List II |
|----|---------|------------|
| 2. | A) ccp | 1) ABAB |
| | B) hcp | 2) BCC |
| | C) CsCl | 3) ABC ABC |

The correct match is

A.

A	B	C
2	3	1

B.

A	B	C
3	1	2

- C. $\begin{matrix} A & B & C \\ 1 & 3 & 2 \end{matrix}$
- D. $\begin{matrix} A & B & C \\ 3 & 2 & 1 \end{matrix}$

Answer: B



Watch Video Solution

3. Coordination number for Cu is

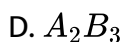
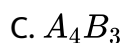
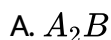
- A. 1
- B. 6
- C. 8
- D. 12

Answer: D



Watch Video Solution

4. Atoms of an element 'A' occupy tetrahedral voids in the hexagonal close packed (hcp) unit cell lattice formed by the element 'B'. The formula of the compound formed by 'A' and 'B' is



Answer: C



Watch Video Solution

5. AB is an ionic solid. If the ratio of ionic radii of A^+ and B^+ is 0.52.

What is the co-ordination number of B?

A. 2

B. 3

C. 6

D. 8

Answer: C



Watch Video Solution

6. The percentages of void space for simple cubic, body centred cubic and hexagonal close packed arranged respectively are

A. 48, 32, 26

B. 48, 26, 32

C. 26, 48, 32

D. 32, 48, 26

Answer: A



Watch Video Solution

7. Which of the following is an example of body centred cube ?

- A. Mg
- B. Zinc
- C. Copper
- D. Potassium

Answer: D



Watch Video Solution

8. The co-ordination number of a metal crystallising in a hexagonal close paced structure is :

- A. 12
- B. 4
- C. 8
- D. 6

Answer: A



Watch Video Solution

9. An octahedral void is surrounded by how many spheres ?

A. 6

B. 4

C. 8

D. 12

Answer: A



Watch Video Solution

10. How many Cl^{-} ions are there around Na^{+} ion in NaCl crystal

A. 3

B. 4

C. 6

D. 8

Answer: C



Watch Video Solution

11. The void between two oppositely directed planar triangles of spheres in adjacent layers is called

A. Cubic void

B. Tetrahedral void

C. Octahedral void

D. Tetrahedral (or) Octahedral void

Answer: C



Watch Video Solution

12. In a cubic close packed structure the number of nearest neighbours for a given lattice point is

- A. 6
- B. 8
- C. 12
- D. 14

Answer: C



Watch Video Solution

13. Which of the following structure is most uncommon for metals?

- A. simple cubic
- B. B.C.C.
- C. C.C.P

D. H.C.P

Answer: A



Watch Video Solution

14. Which of the following packing is more efficient:

- A. square close - packing
- B. hexagonal close - packing
- C. tetrahedral arrangement
- D. none of the above

Answer: B



Watch Video Solution

15. The packing efficiency in a simple cubic cell system of crystals is

A. 68 %

B. 52 %

C. 74 %

D. 92 %

Answer: B



Watch Video Solution

16. The packing fraction for a body centred cube

A. 0.74

B. 0.76

C. 0.68

D. 0.86

Answer: C



Watch Video Solution

17. Density of a crystal is given by :

A. $\frac{a^3 \times M}{z \times N_0}$

B. $\frac{N_0 \times M}{z \times a^3}$

C. $\frac{z \times M}{a^3 \times N_0}$

D. $\frac{A^3 \times N^0}{z \times M}$

Answer: C



Watch Video Solution

18. The percent of void space in a body - centred cubic lattice is :

A. 32 %

B. 48 %

C. 53 %

D. 68 %

Answer: A



Watch Video Solution

19. Calculate the efficiency of the packing in case of face - centered cubic crystal .

A. 52 %

B. 68 %

C. 74 %

D. 92 %

Answer: C



Watch Video Solution

1. At zero kelvin, most of the ionic crystals possess

- A. Frenkel defect
- B. Schottky defect
- C. Metal excess defect
- D. No defect

Answer: D



Watch Video Solution

2. 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

Answer: C



Watch Video Solution

3. In a solid lattice the cation has left a lattice site and is located at an interstitial position, the lattice defect is

A. Metal excess defect

B. Vacancy defect

C. Frenkel defect

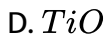
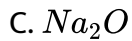
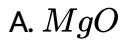
D. Schottky defect

Answer: C



Watch Video Solution

4. Non stoichiometric solid among the following



Answer: D



Watch Video Solution

5. Which of the following has both Schottky and Frenkel defects.



Answer: A



Watch Video Solution

Objective Exercise 1 Properties Of Solids

1. On doping Ge metal with a little of gallium one gets

- A. p - type semi conductor
- B. n - type semi conductor
- C. Insulator
- D. Rectifier

Answer: A



Watch Video Solution

2. A solid with high electrical and thermal conductivity from the following is

A. *Si*

B. *Li*

C. *NaCl*

D. Ice

Answer: B



Watch Video Solution

3. Which substance will conduct the current in the solid state

A. Diamond

B. Graphite

C. Iodine

D. Sodium chloride

Answer: B



Watch Video Solution

4. Metals have conductivity in the order of $(\text{ohm}^{-1} \text{ cm}^{-1})$

A. 10^{12}

B. 10^8

C. 10^2

D. 10^{-6}

Answer: B



Watch Video Solution

5. An example of substance for metallic or insulating properties depending on temperature

A. TiO

B. CrO_2

C. VO_2

D. ReO_3

Answer: C



Watch Video Solution

6. Molten sodium chloride conducts electricity due to the presence of

A. Free electrons

B. Free ions

C. Free molecules

D. Atoms of sodium and chlorine

Answer: B



Watch Video Solution

7. A diode is

- A. only n type of semiconductor
- B. npn or pnp type of semiconductor
- C. only p type of semiconductor
- D. only npn type of semiconductor

Answer: B



Watch Video Solution

8. Which of the following is ferromagnetic

A. Ni

B. Co

C. CrO_2

D. All

Answer: D



Watch Video Solution

9. Ferromagnetic substances have

A. Zero magnetic moment

B. Small magnetic moment

C. Large magnetic moment

D. Any value of magnetic moment

Answer: C



Watch Video Solution

10. Extent of Ferromagnetism is maximum in

A. Fe

B. Ni^{2+}

C. Co^{3+}

D. Cu^{2+}

Answer: A



Watch Video Solution

Objective Exercise 2 Types Of Solids Of Crystal Structures

1. Which of the following is not the true about crystalline solids

A. They are rigid and hard

- B. They possess plane surfaces
- C. They are obtained by rapid cooling of molten substances
- D. They have definite geometric configuration.

Answer: C



Watch Video Solution

2. The constituent particles in carborundum

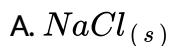
- A. atoms
- B. molecules
- C. +ve ions
- D. +ve ions in a sea of electrons

Answer: A



Watch Video Solution

3. Among the following highest melting point is associated with



B. Graphite



D. K

Answer: B



Watch Video Solution

4. point that is located at the corner of a unit cell is shared by how many unit cells ?

A. 2

B. 4

C. 6

D. 8

Answer: D



Watch Video Solution

5. The number of lattice points per unit cell in B.C.C and end centered lattice respectively

A. 6, 6

B. 9, 10

C. 6, 8

D. 6, 10

Answer: B



Watch Video Solution

6. Dry ice is an example of

- A. ionic solid
- B. molecular solid
- C. covalent solid
- D. metallic solid

Answer: B



Watch Video Solution

7. The coordination numbers of oxygen and silicon in SiO_4 respectively

- A. 1, 2
- B. 2, 1
- C. 2, 4
- D. 4, 2

Answer: C



Watch Video Solution

8. In metal lattices the co-ordination number of metal atom is usually

A. 2 (or) 4

B. 4 (or) 6

C. 6 (or) 8

D. 8 (or) 12

Answer: D



Watch Video Solution

9. All axial distances are unequal as well as all axial angles are unequal in the system

A. Monoclinic

B. Trigonal

C. Triclinic

D. Hexagonal

Answer: C



Watch Video Solution

10. The crystal system having rectangular prisms is

A. Triclinic

B. rhombic

C. trigonal

D. Hexagonal

Answer: B



Watch Video Solution

11. The crystal system without any element of symmetry is

- A. monoclinic
- B. hexagonal
- C. triclinic
- D. cubic

Answer: C



Watch Video Solution

12. White Sn belongs to one of the seven crystal systems. The number of Bravis lattices possible for that monoclinic crystal system

- A. 2
- B. 1

C. 4

D. 2

Answer: A



Watch Video Solution

13. Parameters in trigonal structure are

A. $\alpha = \beta = \gamma \neq 90^\circ$

B. $\alpha = \beta = \gamma = 90^\circ$

C. $\alpha \neq \beta \neq \gamma \neq 90^\circ$

D. $\alpha = \gamma = 90^\circ \beta > 90^\circ$

Answer: A



Watch Video Solution

14. Among the unit cells given below, which two are highly symmetric and unsymmetric respectively

- A. Hexagonal, cubic
- B. Orthorhombic, cubic
- C. Cubic, triclinic
- D. Monoclinic, cubic

Answer: C



Watch Video Solution

15. For a crystal, the angle of diffraction (2θ) is 90° and the second order line has a d value of $2.28\text{\AA}$. The wavelength (in $\text{\AA}$) of X-rays used for Bragg's diffraction is

- A. $1.71\text{\AA}$
- B. $1.14\text{\AA}$

C. 2.28°

D. 2.0°

Answer: A



Watch Video Solution

16. If two waves with the amplitude of E_0 each undergo constructive interference, the amplitude of the resulting wave is

A. 0

B. $< 2E_0$

C. $2E_0$

D. E_0^2

Answer: C



Watch Video Solution

Objective Exercise 2 Close Packed Structures And Voids

1. In a hexagonal closest packing in two layers one above the other, the coordination number of each sphere will be

A. 4

B. 6

C. 8

D. 9

Answer: D



Watch Video Solution

2. In a close packed lattice containing 'n' particles, the number of tetrahedral and octahedral voids respectively

A. $n, 2n$

B. n, n

C. $2n, n$

D. $2n, n/2$

Answer: C



Watch Video Solution

3. The number of octahedral voids in a unit cell of cubic close packed structure is

A. 1

B. 2

C. 4

D. 8

Answer: C



Watch Video Solution

4. The intermetallic compound LiAg crystallizes in cubic lattice in which both lithium and silver have co-ordination number of eight. The crystal class is

- A. simple cubic
- B. body centered cubic
- C. face - centered cubic
- D. none of these

Answer: B



Watch Video Solution

5. In the crystals of which of the following ionic compounds would you expect maximum distance between the centres of the cations and anion

- A. LiF

B. CsF

C. CsI

D. LiI

Answer: C



Watch Video Solution

6. Gold crystallizes with a

A. fcc

B. bcc

C. simple cubic

D. orthorhombic

Answer: A



Watch Video Solution

7. When molten zinc is cooled to solid state, it assumes HCP structure.

Then the number of nearest neighbours of zinc atom will be

A. 4

B. 8

C. 6

D. 12

Answer: D



Watch Video Solution

8. Sodium crystallizes in a bcc lattice, hence the coordination number of sodium in sodium metal is

A. 0

B. 4

C. 6

D. 8

Answer: D



Watch Video Solution

9. 26 % void space in its crystal structure is observed for

A) FCC structure

B) HCP structure C)

CCP structure

A. A only

B. B only

C. C only

D. All A, B, C

Answer: D



Watch Video Solution

10. In modern periodic table, the position of the element with atomic number '84' is

- A. 6th group, 6th period
- B. IVA group, 6th period
- C. 16th group, 6th period
- D. VIA group, 5th period

Answer: C



Watch Video Solution

11. The percentage of void space of a metallic element crystallising in a ABCABCtype lattice pattern is

- A. 24 %
- B. 26 %

C. 34 %

D. 74 %

Answer: B



Watch Video Solution

12. If the radius of K^+ and F^- are 133 pm and 136 pm respectively, the distance between K^+ and F^- in KF is..... pm

A. 269

B. 134.5

C. 136

D. 3

Answer: A



Watch Video Solution

Objective Exercise 2 Crystal Defects

1. Schottky defect causes

- A. Increase in the density of solid
- B. Decrease in the density of solid
- C. No change in the density of solid
- D. Decrease in the conductivity of solid.

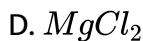
Answer: B



Watch Video Solution

2. Which among the following is likely to have Schottky defect.

- A. $AgCl$
- B. $NaCl$
- C. $TiCl$

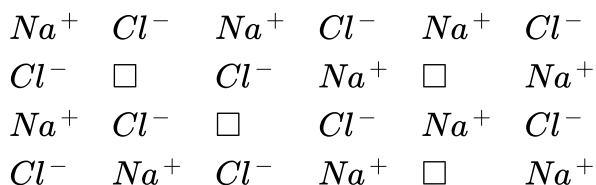


Answer: D



Watch Video Solution

3. What type of crystal defect is indicated in the diagram below



A. Frenkel defect

B. Frenkel and Schottky defects

C. Interstitial defect

D. Schottky defect

Answer: B



Watch Video Solution

4. 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 from the lattice
- C. An ion leaves its normal site and occupies an interstitial cells
- D. Density of the crystal is increased

Answer: B



Watch Video Solution

List - I

List - II

5.

A) Crystal defect	1) Amorphous
B) Carborundum	2) Frenkel
C) Quartz glass	3) Covalent crystal

The correct match is

A.

<i>A</i>	<i>B</i>	<i>C</i>
3	1	2

B.

<i>A</i>	<i>B</i>	<i>C</i>
2	1	3

- C. $\begin{array}{ccc} A & B & C \\ 2 & 3 & 1 \end{array}$
- D. $\begin{array}{ccc} A & B & C \\ 1 & 2 & 3 \end{array}$

Answer: C



Watch Video Solution

6. The formula of an oxide of iron is $Fe_{0.93}O_{1.00}$. If the compound has hundred O^{-2} ions, then it contains

- A. $93Fe^{+2}$ ions
- B. $93Fe^{+3}$ ions
- C. $79Fe^{+2}$, $14Fe^{+3}$
- D. $93Fe^{+2}$, $14Fe^{+3}$

Answer: C



Watch Video Solution

Objective Exercise 2 Properties Of Solids

1. To get n-type semiconductor, impurity to be added to silicon should have the following number of valence electrons

A. 2

B. 3

C. 1

D. 5

Answer: D



Watch Video Solution

2. The oxide that does not act as an insulator even by a change in temperature

A. VO_2

B. TiO

C. VO

D. TiO_2

Answer: B



Watch Video Solution

3. In which of the following the conductivity would be in the order of $10^{-4} \text{ ohm}^{-1} \text{ cm}^{-1}$

A. $NaCl_{(s)}$

B. $Na_{(s)}$

C. diamond

D. Ge

Answer: D



Watch Video Solution

4. Germanium can be made n-type semi conductor by doping with

- A. silicon
- B. arsenic
- C. gallium
- D. either As (or) Ga

Answer: B



Watch Video Solution

5. The magnetic behavior is different from others in

- A. O_2
- B. VO_2
- C. ZrO_2

D. Ti_2O_3

Answer: C



Watch Video Solution

6. Which of the following is correct statement

A. silicon doped with boron is n-type semiconductor

B. silicon doped with arsenic is a p-type semiconductor

C. metals are good conductors of electricity

D. electrical conductivity of semiconductors decreases with increasing temperature

Answer: C



Watch Video Solution

7. The general formula of ferrites is MFe_2O_4 . Where 'M' would not be

A. Mg

B. Cu

C. Al

D. Zn

Answer: C



Watch Video Solution

8. Which substance shows anti ferro magnetism?

A. ZrO_2

B. CdO

C. CrO_2

D. V_2O_3

Answer: D



Watch Video Solution

9. The alignment of magnetic dipoles shown below $\uparrow \downarrow \downarrow \uparrow \downarrow \downarrow$ represents which of the following ?

- A. Diamagnetism
- B. Ferri magnetism
- C. Ferro magnetism
- D. Anti-ferromagnetism

Answer: B



Watch Video Solution

List - I

List - II

10. A) Antiferromagnetic 1) $ZnFe_2O_4$
B) Covalent crystal 2) MnO
C) Ferrimagnetic 3) Diamond

The correct match is

A.

<i>A</i>	<i>B</i>	<i>C</i>
2	3	1

B.

<i>A</i>	<i>B</i>	<i>C</i>
3	2	1

C.

<i>A</i>	<i>B</i>	<i>C</i>
1	2	3

D.

<i>A</i>	<i>B</i>	<i>C</i>
1	3	2

Answer: A



Watch Video Solution

11. Which of the following is paramagnetic ?

A. Na_2O

B. Na_2O_2



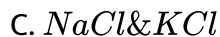
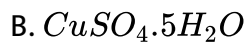
Answer: C



Watch Video Solution

Practice Exercise

1. Which of the following is considered as true amorphous solid



Answer: D



Watch Video Solution

2. The various types of ionic solids differ in their

- A. Nature of bonding
- B. Molar enthalpy of fusion
- C. Electrical and thermal conductivity
- D. All the above

Answer: D



Watch Video Solution

3. In $CsCl$ structure, each Cs^+ ion is surrounded by

- A. $4Cl^-$ ions
- B. $6Cl^-$ ions
- C. $8Cl^-$ ions

D. 12Cl^- ions

Answer: C



Watch Video Solution

4. In crystal structure of sodium chloride, the arrangement of Cl^- ions is

A. fcc

B. bcc

C. Both fcc and bcc

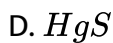
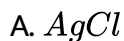
D. None of these

Answer: A



Watch Video Solution

5. In which of the following, cation occupies cubic void.

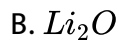


Answer: B



Watch Video Solution

6. Which of the following possess 2: 1 type of structure.



Answer: B



Watch Video Solution

7. The positions of Cl^- ions in NaCl structure are

- A. Corners of the cube
- B. Centres of faces of the cube
- C. Corners as well as face centres of the cube
- D. Edge centres of the cube

Answer: C



Watch Video Solution

8. The number of NaCl units present in a unit cell of NaCl are

- A. 1

B. 2

C. 4

D. 8

Answer: C



Watch Video Solution

9. The atomic radius for a face - centred cubic cell of lattice parameter 'a' is

A. $\frac{\sqrt{2}}{4}a$

B. $\frac{\sqrt{3}}{4}a$

C. $\frac{a}{2}$

D. $\frac{a}{\sqrt{8}}$

Answer: A



Watch Video Solution

10. The lattice parameter (edglength) for a body-centred cubic cell of atomic radius r ? is :

A. $\sqrt{8}r$

B. $\frac{\sqrt{3}}{4}r$

C. $\frac{1}{2\sqrt{2}}r$

D. $\frac{4r}{\sqrt{3}}$

Answer: D



Watch Video Solution

List - I

List - II

A) Ionic solid

1) soft

11. B) Covalent Solid

2) Hard and Brittle

C) Molecular solid

3) very hard

D) Metallic solid

4) Malleable and ductile

The correct match is

- A.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
1	2	3	4
- B.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
2	3	4	1
- C.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
2	3	1	4
- D.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
1	2	4	3

Answer: C



Watch Video Solution

12. The lattice parameter for a simple cubic unit cell of atomic radius 'r' is

A. $2r$

B. $\frac{4r}{\sqrt{3}}$

C. $\sqrt{8}r$

D. $\frac{\sqrt{3}}{4}r$

Answer: A



Watch Video Solution

13. The packing fraction in a simple cubic cell of crystals is :

A. $\frac{\pi}{6}$

B. $\frac{\sqrt{3}}{8}\pi$

C. $\frac{1}{2\sqrt{2}}\pi$

D. $\frac{\sqrt{2}}{6}\pi$

Answer: A



Watch Video Solution

14. A solid AB has NaCl type structure. If the radius of the cation A is 100 pm, then the maximum possible radius of the anion B will be

A. 241 pm

B. 414 pm

C. 225 pm

D. 44.4 pm

Answer: A



Watch Video Solution

15. Which one of the following statements is incorrect about rock salt type ?

A. It has fcc arrangement of Cl^-

B. Na^+ and Cl^- ions have a co-ordination number of 6:6

C. A unit cell of NaCl consists of four NaCl units

D. All halides of alkali metals have rock-salt type structure

Answer: D



Watch Video Solution

16. In sodium chloride, Cl^- ions form ccp arrangement. In which sites, Na^+ ions will occupy in this structure

- A. Cubic voids
- B. Tetrahedral voids
- C. All octahedral voids
- D. Half of octahedral voids

Answer: C



Watch Video Solution

17. The packing fraction in a face - centred cubic cell of crystals is

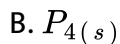
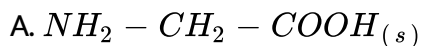
- A. $\frac{\sqrt{3}}{8}a$
- B. $\frac{\pi}{6}$
- C. $\frac{\sqrt{2}}{6}\pi$
- D. $\frac{1}{2\sqrt{2}}\pi$

Answer: C



Watch Video Solution

18. A hydrogen bonded molecular crystal among the following:



Answer: A



Watch Video Solution

19. The crystal system of a compound with unit cell dimensions $a = 0.387$, $b = 0.387$ and $c = 0.504nm$ and $\alpha = \beta = 90^\circ$ and $\gamma = 120^\circ$ is

A. Cubic

B. Hexagonal

C. Orthorhombic

D. Rhombohedral

Answer: B



Watch Video Solution

List - I

(Crystal System)

List - II

(Exmaple)

20. A) Orthorhombic 1) Graphite
B) Monoclinic 2) $MgSO_4 \cdot 7H_2O$
C) Triclinic 3) $FeSO_4 \cdot 7H_2O$
D) Hexagonal 4) H_3BO_3

A. $\begin{matrix} A & B & C & D \\ 2 & 3 & 4 & 1 \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ 2 & 3 & 1 & 4 \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ 1 & 2 & 3 & 4 \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ 1 & 2 & 4 & 3 \end{matrix}$

Answer: A



Watch Video Solution

21. Three metals X, Y and Z are crystallised in simple cubic, B. C. C and F.C.C lattices respectively. The number of unit cells in one mole each of the metals respectively

A. $N, \frac{N}{2}, \frac{N}{4}$

B. $N, 2N, 4N$

C. $4N, 2N, N$

D. $\frac{N}{4}, \frac{N}{2}, N$

Answer: A



Watch Video Solution

22. X-rays of wavelength equal to 0.134 nm give a first order diffraction from the surface of a - crystal when the value of θ is 10.5° , then the distance between the adjacent planes in the crystal is $(\sin 10.5^\circ = 0.1822)$

A. 367 nm

B. 3.67 nm

C. 0.367 nm

D. 0.0367 nm

Answer: C



Watch Video Solution

23. In a diffraction experiment, X-rays of wavelength 0.14 nm were used on a crystal. 'n' is the order of diffraction that occurs at an angle θ of 19.5° . If the interplanar distance is 0.42nm. n value is $(\sin 19.5^\circ = 0.333)$

A. 1

B. 2

C. 3

D. 4

Answer: B



Watch Video Solution

24. (A): ABAB pattern of close packing gives hcp arrangement

(R): In hcp arrangement each sphere is associated with two tetrahedral voids

A. Both (A) and (R) are true. (R) properly explain (A)

B. Both (A) and (R) are true. (R) does not explain (A)

C. (A) is true. (R) is false

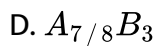
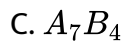
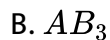
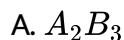
D. (A) is false. (R) is true

Answer: B



Watch Video Solution

25. In a cubic arrangement of A and B atoms, A atoms are at corners of unit cell and B atoms at edge centres. One "A" atom is missing from one corner in each unit cell. The simplest formula of the compound is



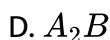
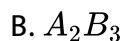
Answer: D



Watch Video Solution

26. In a hypothetical ionic crystal, B is arranged in cubic close packing and A occupies all octahedral voids and alternative tetrahedral voids.

The correct formula of the compound



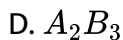
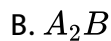
Answer: D



Watch Video Solution

27. In an ionic crystal, cation "A" occupies the lattice points in a FCC array and anion "B" occupies the two types of tetrahedral voids. The correct formula of the ionic compound is



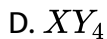
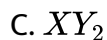
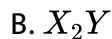


Answer: A



Watch Video Solution

28. A solid is made up of two types of atoms "X" and "Y". Atoms of "X" occupy all the tetrahedral sites while the atoms of "Y" have hcp arrangement. Its formula is



Answer: B



[Watch Video Solution](#)

29. (A) : In many crystal structures of ionic substances cations occupy the voids created by anions.

(R) : Cations are smaller than anions.

A. Both (A) and (R) are true. (R) properly explain (A)

B. Both (A) and (R) are true. (R) does not explain (A)

C. (A) is true. (R) is false

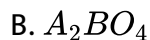
D. (A) is false. (R) is true

Answer: A



[Watch Video Solution](#)

30. In a compound oxide ions have CCP arrangement. Cations A are present in one-eighth of the tetrahedral holes and cations B occupy half of the octahedral holes. The simplest formula of the compound is

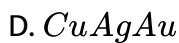
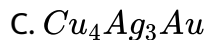
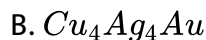
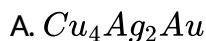


Answer: A



Watch Video Solution

31. An alloy of Cu, Ag and Au is found to have copper constituting the CCP lattice. If silver atoms occupy edge centres and gold atom is present at body centre, the alloy formula is



Answer: C



Watch Video Solution

32. In polonium the total space occupied by the atoms in its crystal lattice is

A. 52 %

B. 68 %

C. 74 %

D. 32 %

Answer: A



Watch Video Solution

33. Edge length of a cube is 400 pm. Then its bodydiagonal length would be

A. 600 pm

B. 566pm

C. 693 pm

D. 500 pm

Answer: C



Watch Video Solution

34. Copper crystallises in fcc with a unit cell length of 361 pm. What is the radius of copper atom ?

A. 127 pm

B. 157 pm

C. 181 pm

D. 108 pm

Answer: A

[Watch Video Solution](#)

35. Ar crystallizes in a F.C.C lattice with one atom at each lattice point. If the edge length is $5.311\text{\AA}$ at OK, the distance between nearest neighbouring atoms in Ar at 'O'K is

A. $3.755\text{\AA}$

B. $7.355\text{\AA}$

C. $5.735\text{\AA}$

D. $1.877\text{\AA}$

Answer: A

[Watch Video Solution](#)

36. Sodium crystallises in body centred cubic lattice. The edge length of its unit cell is 0.424 nm . The density of the metal is

A. $1.002 \times 10^6 \text{ gm/cc}$

B. 1.002 kg/m^3

C. $1.002 \times 10^3 \text{ kg/m}^3$

D. $1.002 \times 10^3 \text{ gm/cc}$

Answer: C



Watch Video Solution

37. A metallic element exists in simple cubic structure. Each edge length of the unit cell is $3\text{\AA}$. The density of metal is 10 gm cm^{-3} . How many unit cells will be there in 16.2 gm of the metal?

A. 6×10^{22}

B. 16×10^{31}

C. 28

D. 42

Answer: A



Watch Video Solution

38. At room temperature, Polonium (atomic weight 209gmmol^{-1}) crystallises in a primitive cubic unit cell. If $a = 3.36\text{\AA}$, calculate the theoritical density of Polonium..

A. 6.28 gm cm^{-3}

B. 9.1 gm cm^{-3}

C. 3.18 gm cm^{-3}

D. 6.68 gm cm^{-3}

Answer: B



Watch Video Solution

39. Iron (α -form) crystallises in a body - centred cubic system with edge length 2.86 Å. The density of iron is : (At.wt of Fe=56)

A. 7.93 gm cm^{-3}

B. 9.15 gm cm^{-3}

C. 0.72 gm cm^{-3}

D. 4.22 gm cm^{-3}

Answer: A



Watch Video Solution

40. A crystalline solid substance has a density of 10 g/cm^3 and the length of the edge of the unit cell (FCC) is 2.0 Å . How many number of atoms are present in 200 grams of the solid?

A. 2×10^{23}

B. 1×10^{26}

C. 1×10^{25}

D. 5×10^{27}

Answer: C



Watch Video Solution

41. An element crystallises in a structure having a f.c.c unit cell of an edge 200 pm. Calculate the density of element, if 20 gm the element contains 2.4×10^{23} atoms.

A. 10.7 gm cm^{-3}

B. 2.28 gm cm^{-3}

C. 41.6 gm cm^{-3}

D. 7.0 gm cm^{-3}

Answer: C



Watch Video Solution

42. A substance forms f.c.c. crystal structure. Its density is 1.984 gm cm^{-3} and the length of the edge of the unit cell is 630 pm. Calculate the molar mass.

- A. 100 amu
- B. 95.2 amu
- C. 87.2 amu
- D. 74.7 amu

Answer: D



Watch Video Solution

43. The density of crystalline NaCl is 2.165 gm cm^{-3} . What would be the volume of the cube containing one mol of NaCl ?

- A. 3 cm^3

B. 6cm^3

C. 12cm^3

D. 27cm^3

Answer: D



Watch Video Solution

44. The unit cell of aluminium is a cube with an edge length of 405 pm. The density of aluminium is 2.70 gm cm^{-3} . What is the type of unit cell of aluminium crystals ?

A. simple cubic

B. body - centred cubic

C. face - centred cubic

D. hexagonal

Answer: C

[Watch Video Solution](#)

45. The Cubic Unit cell of a metal ($molar mass = 63.55 g mol^{-1}$) has an edge length of 362 pm. Its density is $8.92 g. cm^{-3}$. The type of unit cell is

- A. Primitive
- B. Face centred
- C. Body centred
- D. End centred

Answer: B

[Watch Video Solution](#)

46. $CsBr$ crystallise in a body centred cubic lattice. The unit cell length is 436.6 pm. Given that the atomic mass of Cs = 133 and that of Br = 80 amu and Avogadro number being $6.02 \times 10^{23} mol^{-1}$, the density of $CsBr$ is

A. $4.25g/cm^3$

B. $42.4g/cm^3$

C. $0.425g/cm^3$

D. $8.25g/cm^3$

Answer: A



Watch Video Solution

47. When ZnO is heated to elevated temperatures which is incorrect statement ?

A. Conductivity increases

B. It becomes non stoichiometric

C. It acquires metal deficient defect

D. It acquires colour due to the trapped electrons

Answer: A



[Watch Video Solution](#)

48. The electron can flow from electronic band to conduction band if the electronic band is

- A. incompletely filled
- B. completely filled having less energy gap with conduction band
- C. completely filled having large energy gap with the conduction band
- D. 1 and 2

Answer: D



[Watch Video Solution](#)

49. The following substance will be yellow when hot and white when cold

- A. MgO

B. ZnO

C. Na_2O

D. CaO

Answer: B



Watch Video Solution

50. At room temperature all crystals have

A. $\Delta s = -ve$

B. $\Delta s = +ve$

C. $\Delta s = 0$

D. $\Delta s = -ve$ or $+ve$

Answer: B



Watch Video Solution

51. The conductivity values in MnO is in the order of

A. $10^{-6} - 10^4 \text{ ohm}^{-1} \text{ cm}^{-1}$

B. $10^3 - 10^8 \text{ ohm}^{-1} \text{ cm}^{-1}$

C. $10^{-10} - 10^{-22} \text{ ohm}^{-1} \text{ cm}^{-1}$

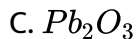
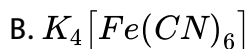
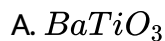
D. $10^{-6} - 10^4 \text{ ohm}^{-1} \text{ cm}^{-1}$

Answer: C



Watch Video Solution

52. Which of the following is ferromagnetic compound ?



D. none of these

Answer: D



Watch Video Solution

53. Among the following in which conductivity decreases with increase in temperature

I) Ag

II) Molten $NaCl$

III) $NaCl_{(aq)}$

IV) Si

A. I,II

B. II,III

C. I,IV

D. Only I

Answer: D



Watch Video Solution

54. The nature of NiO at $250^{\circ}C$

- A. Paramagnetic
- B. Ferro magnetic
- C. Ferri magnetic
- D. Anti ferromagnetic

Answer: A



Watch Video Solution

55. The number of unit cells in 58.5 g of NaCl is approximately

- A. 6×10^{20}
- B. 1.5×10^{23}
- C. 6×10^{23}

D. 0.5×10^{24}

Answer: B



Watch Video Solution

56. The 8: 8 type of packing is present in



Answer: C



Watch Video Solution

57. Packing fraction in a body - centred cubic cell of crystals is

A. $\frac{\sqrt{3}}{8}\pi$

B. $\frac{\pi}{6}$

C. $\frac{\sqrt{2}}{6}\pi$

D. $\frac{1}{2\sqrt{2}}\pi$

Answer: A



Watch Video Solution

58. When electrons are trapped into the crystal in anion vacancy, the defect is known as

A. Schottky defect

B. Frenkel defect

C. Stoichiometric defect

D. F-centre defect

Answer: D



Watch Video Solution

59. The radius of Na^+ is 95 pm and that of Cl^- ion is 181 pm. Hence the co-ordination number of Na^+ will be

A. 4

B. 6

C. 8

D. 2

Answer: B



Watch Video Solution

60. If the distance between Na^+ and Cl^- ions in NaCl crystal is 'a'pm, what is the length of the cell edge ?

A. $2a$ pm

B. $9/2$ pm

C. $4a$ pm

D. $a/4$ pm

Answer: A



Watch Video Solution

61. When LiCl is doped with Li vapours the colour developed is

A. Violet

B. Yellow

C. Pink

D. Green

Answer: C



Watch Video Solution

62. The appearance of colour in solid alkali metal halides is generally due to

- A. Interstitials
- B. F-centres
- C. Schottky defect
- D. Frenkel defect

Answer: B



Watch Video Solution

63. In which of the following crystal structure the void efficiency is 32 % ?

- A. simple cube
- B. face centered cube
- C. hexagonal close packing

D. body centered cube

Answer: D



Watch Video Solution