



# CHEMISTRY

## BOOKS - MBD CHEMISTRY (ODIA ENGLISH)

### SOLID STATE

#### Question Bank

1. Which state of matter has definite mass, volume and shape ?



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2. What is amorphous solid ?



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3. Which solids behave like super cooled liquid ?



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4. Which type of solids have long range order and sharp melting point ?



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5. What are the different categories of crystalline solids ?



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6. Which does influence the cleavage?



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7. Give an example of hcp and bcc crystals.



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8. What is the coordination number of each sphere in:

(i) Hexagonal close packed structure and



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**9.** What is the coordination number of each sphere in :

Body-centred cubic structure.



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**10.** What is the coordination number of each ion in NaCl ?



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**11.** What are the coordination numbers of  $Cs^+$  and  $Cl^-$  in CsCl lattice ?



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**12.** What is the formula of density (d) of unit cell ?



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**13.** What is called crystal lattice ?



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**14.** What is unit cell ?



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**15.** How many types of primitive unit cells are there ?



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**16.** Name two most efficient close packed lattices.



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**17.** Give two examples of amorphous solid.



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**18.** The number of atoms in bcc arrangement is



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19. What is the radius ratio range ( $r^+ / r^-$ ) for ionic solids with bcc structure ?



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20. What is the co-ordination number of  $Ca^{2+}$  and  $F^-$  ions in  $CaF_2$  lattice ?



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21. Co-ordination number of HCP crystal is -



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22. What is the coordination number of each atom in ccp structure?



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23. What is co-ordination number of each sphere in bcc packed structure ?



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24. \_\_\_\_\_ solids are isotropic in nature.



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25. \_\_\_\_\_ solids are anisotropic in nature.



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**26.** Predict the percentage of space filled by particles in simple cubic lattice.



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**27.** Cubic close-packed (ccp) lattice is also called\_\_\_\_\_



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**28.** Two types of voids are\_\_\_\_\_and\_\_\_\_\_



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29. Iodine is \_\_\_\_\_ type solid.



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30. Ice is an example of \_\_\_\_\_ type crystal



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**31.** Two examples of covalent crystals are \_\_\_\_\_ and \_\_\_\_\_



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**32.** In simple ionic crystals \_\_\_\_\_ or \_\_\_\_\_ types of arrangement are generally -present.



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**33.** In ionic crystals \_\_\_\_\_ ions adopt ccp or hcp arrangement, while \_\_\_\_\_ ions occupy interstitial sites



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**34.** In NaCl crystal \_\_\_\_\_ ions occupy all the octahedral sites.



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**35.** What are the coordination numbers of  $Cs^+$  and  $Cl^-$  in CsCl lattice ?



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**36.** In NaCl crystal, one  $Na^+$  ion is surrounded by \_\_\_\_  $Cl^-$  ions.



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**37.** Two metals showing cubic close packed (ccp) structure are \_\_\_\_\_ and \_\_\_\_\_



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**38.** Two metals exhibiting hcp arrangement are \_\_\_\_\_ and \_\_\_\_\_



**Watch Video Solution**

**39.** In ionic crystals \_\_\_\_\_ ions adopt ccp or hcp arrangement, while \_\_\_\_\_ ions occupy interstitial sites



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**40.** The number of nearest neighbours with which a given sphere is in contact is called \_\_\_\_\_



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41. If radius ratio ( $r^+ / r^-$ ) is in the range 0.414 to 0.732, the possible co-ordination number is \_\_\_\_\_ and structural arrangement is \_\_\_\_\_



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42. Zinc blende type structure has \_\_\_\_\_ co-ordination, while cesium chloride type, structure has \_\_\_\_\_ co-ordination.



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43. Carborandum and dry ice are \_\_\_\_\_ and \_\_\_\_\_ type of crystal respectively



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44. Co-ordination numbers of  $Cs^+$  and  $Cl^-$  in CsCl crystal are in the ratio ?



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**45.** Zinc blende type structure has what coordination ratio?



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**46.** Iodine is an ionic type solid.

A. true

B. false

C.

D.

**Answer:**



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**47.** Predict the percentage of space filled by particles in simple cubic lattice.



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**48.** Cubic close-packed (ccp) lattice also called bcc is it true or false?



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**49.** Why solids have definite mass, volume and shape ?



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**50.** What are Bravais Lattices ?



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**51.** Name two most efficient close packed lattices.



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**52.** How can you convert NaCl structure to CsCl structure and vice versa ?



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**53.** What are the common types of defects in solids ?



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**54.** What are different types of points defects ?



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**55.** Distinguish between anisotropy and isotropy.



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**56.** The total number of atoms per unit cell of a face centred cubic crystal is



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**57.** Predict the percentage of space filled by particles in fcc



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**58.** Predict the percentage of space filled by particles in bcc



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**59.** Predict the percentage of space filled by particles in simple cubic lattice.



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**60.** Define unit cell and 'space lattice'. What do you understand by simple, face-centred and body-centred unit cell.



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**61.** Briefly describe the main features of each of the different types of structures of the ionic compounds of the type AB.



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**62.** Briefly describe how the packing of the constituent particles in a crystal takes place.



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**63.** What is meant by radius ratio ? How is it helpful in determining the geometry of the ionic solid ?



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**64.** Give two difference between crystalline and amorphous solids.



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**65.** On the basis of the nature of bonding how can crystalline solids be classified into different types ?



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**66.** Explain fcc and bcc type of crystal structure and describe their characteristics.



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**67.** Describe the characteristics of hexagonal close packed structure giving examples.



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**68.** Describe fcc, bcc and hcp crystals of simple ionic compounds.



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**69.** Briefly describe various types of point defects with examples.



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**70.** Explain electrical properties of solids using band theory.



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**71.** Briefly explain various types of magnetic properties of solids



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**72.** Discuss the formation of n-type semiconductors,



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**73.** Discuss the formation of p-type semiconductors,



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**74.** An amorphous solid is:

A. Diamond

B. Graphite

C. Glass

D. Common salt

**Answer: C**



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**75.** The number of basic crystal systems are:

A. 7

B. 8

C. 6

D. 4

**Answer: A**



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76. Bragg's equation is:

A.  $n\lambda = 2\theta \sin \theta$

B.  $n\lambda = 2d \sin \theta$

C.  $2n\lambda = d \sin \theta$

D.  $\lambda = \left(2 \frac{d}{n}\right) \sin \theta$

**Answer: B**



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77. Which is/are covalent solid:

A.  $Fe_2O_3$

B. Diamond

C. Graphite

D. All

**Answer: D**



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**78.** Graphite is an example of:

A. Ionic solid

B. Covalent solid

C. Van der Waals crystal

D. Methallic crystal

**Answer: B**



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79. The number of atoms/molecules contained in one face centred cubic unit cell of a monoatomic substance is:

A. 4

B. 6

C. 8

D. 12

**Answer: A**



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**80.** The number of atoms present in a simple cubic unit cell are:

A. 4

B. 3

C. 2

D. 1

**Answer: D**



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**81.** The rank of a cubic unit cell is 4. The type of cell as:

A. Body centred

B. Face centred

C. Primitive

D. None

**Answer: B**



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**82.** 8:8 coordination of CsCl is found to change into 6:6 coordination on:

- A. Applying pressure
- B. Increasing temperature
- C. Both (a) and (b)
- D. None

**Answer: B**



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**83.** In a crystal some ions are missing from normal sites This is an example of:

A. F-centres

B. Interstitial defect

C. Frenkel defect

D. Schottky defect

**Answer: D**



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**84.** Among the following type of voids, which one is the largest void:

A. Triangular

B. Cubic

C. Tetrahedral

D. Octahedral

**Answer: D**



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85.  $TiO_2$  is well known example of

- A. Triclinic system
- B. Tetragonal system
- C. Monoclinic system
- D. None

**Answer: B**



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**86.** Ionic salts on dissolution in a solvent shows:

- A. A decrease in the viscosity of the liquid
- B. An increase in the viscosity of the liquid
- C. No effect on the viscosity of the liquid
- D. None

**Answer: A**



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**87.** Ionic solids are characterised by:

A. Good conductivity in solid state

B. High vapour pressure

C. Low melting point

D. Solubility in polar solvents

**Answer: D**



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**88.** Each unit cell of NaCl consists of 4 chloride ions and:

A. 13 Na atoms

B. 4 Na ions

C. 6 Na atoms

D. 8 Na atoms

**Answer: B**



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**89.** Silicon dioxide is an example of:

A. Metallic crystal

B. Ionic crystal

C. Covalent crystal

D. None

**Answer: C**



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90. Crystals which are good conductor of heat and electricity are -

- A. Ionic crystals
- B. Covalent crystals
- C. Metallic crystals
- D. Molecular crystals

**Answer: C**



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91. LiF is a/an:

- A. Ionic crystal
- B. Metallic crystal
- C. Covalent crystal
- D. Molecular crystal

**Answer: A**



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92. The structure of CsCl crystal is:

A. Body centred cubic lattice

B. Face centred cubic lattice

C. Octahedral lattice

D. None

**Answer: A**



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**93. ZnS is:**

A. Ionic crystal

B. Covalent crystal

C. Metallic crystal

D. vander Waals crystal

**Answer: A**



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**94.** In graphite crystal, carbon is:

A. sp-hybridised

B.  $sp^2$  – hybridised

C.  $sp^3$  – hybridised

D. None

**Answer: B**



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**95.** In diamond carbon is.....hybridised.

A.  $sp$

B.  $sp^2$

C.  $sp^3$

D. None

**Answer: C**



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**96.**  $Na_2SeO_4$  and  $NaSO_4$  show:

A. Isomorphism

B. Polymorphism

C. Allotropism

D. Ferromagnetism



**Answer: A**



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**97.** A crystal of  $Fe_3O_4$  is:

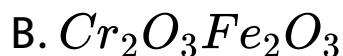
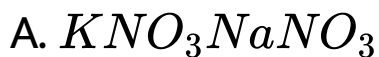
- A. Paramagnetic
- B. Diamagnetic
- C. Ferromagnetic
- D. None

**Answer: C**



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98. Which one is correct about ferrites?



C. Both (a) and (b)

D. None

**Answer: B**



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99. Which one is correct about ferrites?

A. These possess formula  $AB_2O_4$  (where A is divalent and B is trivalent cation)

B. These possess spinel structure

C.  $MgAl_2O_4$  is a ferrite

D. All

**Answer: D**



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**100.** The structure of sodium chloride is

A. Body centred cubic lattice

B. Face centred cubic lattice

C. Octahedral

D. Square planar

**Answer: B**



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**101.** Most crystals show good cleavage because their atoms, ions and molecules are:

- A. Weakly bonded together
- B. Strongly bonded together
- C. Spherically symmetrical
- D. Arranged in planes

**Answer: D**



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**102.** Which of the following statements are true?

A. Piezoelectricity is due to net dipole moment

B. Ferro electricity is due to alignment of dipoles in same direction

C. Pyroelectricity is due to heating polar crystals

D. All

**Answer: D**



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**103.** Frenkel defect is noticed in:

A. AgBr

B. ZnS

C. AgI

D. All

**Answer: D**



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**104.** Schottky defect is noticed is:

A. NaCl

B. KCl

C. CsCl

D. All

**Answer: D**



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**105.** In a body centred cubic cell, an atom at the body of centre is shared by:

- A. 1 unit cell
- B. 4 unit cells
- C. 3 unit cells
- D. 2 unit cells

**Answer: A**



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**106.** In a simple cubic cell, each atom on a corner is shared by:

A. 2 unit cells

B. 1 unit cell

C. 8 unit cells

D. 4 unit cells

**Answer: C**



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**107.** In a face centred cubic cell, an atom at the face centre is shared by:

A. 4 unit cells

B. 2 unit cell

C. 1 unit cells

D. 6 unit cells

**Answer: B**



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**108.** When arrangement of electrons leads to ferromagnetism?

A.  $\uparrow \uparrow \uparrow \downarrow \downarrow$

B.  $\uparrow \downarrow \uparrow \downarrow$

C.  $\uparrow \uparrow \uparrow \downarrow \downarrow \downarrow \downarrow$

D. None

**Answer: C**



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**109.** The number of  $Na^+$  ions which surrounds each  $Cl^-$  ion in the NaCl crystal lattice is:

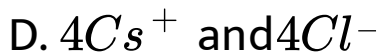
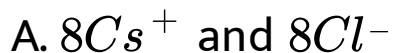
- A. 4
- B. 6
- C. 12
- D. 8

**Answer: B**



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**110.** The mass of a unit cell of CsCl corresponds to:



**Answer: C**



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**111.** The coordination number of a body centred atom is:

A. 4

B. 6

C. 8

D. 12

**Answer: C**



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**112.** In a face centred cubic lattice the number of nearest neighbours for a given lattice point are:

A. 6

B. 8

C. 12

D. 14

**Answer: C**



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**113.** Close packing is maximum in the crystal which is -

A. Simple cubic

B. Face centred

C. Body centred

D. None

**Answer: B**



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**114.** Which is (are) amorphous solids?

A. Rubber

B. Plastics

C. Glass

D. All

**Answer: D**



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**115.** Iodine crystals are:

A. Metallic solid

B. Ionic solid

C. Molecular solid

D. Covalent solid

**Answer: C**



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**116.** The number of molecules of NaCl in an unit cell of its crystal is:

A. 2

B. 4

C. 6

D. 8

**Answer: B**



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**117.** Zinc blende type structure has what coordination ratio?

A. 2

B. 6

C. 4

D. 8

**Answer: C**



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**118.** The ratio of closed packed atoms to tetrahedral holes in cubic close packing is:

A. 1 : 1

B. 1 : 2

C. 1 : 3

D. 2 : 1

**Answer: B**



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**119.** How many kinds of space lattices are possible in a crystal?

A. 23

B. 7

C. 230

D. 14

**Answer: D**



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**120.** The vacant space in body centred cubic lattice bcc unit cell is about:

A. 32 %

B. 10 %

C. 23 %

D. 46 %

**Answer: A**



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**121.** A match box exhibits:

A. Cubic geometry



B. Monoclinic geometry

C. Orthorhombic geometry

D. Tetragonal geometry

**Answer: C**



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**122.** Which stoichiometric defect decreases the density of the crystal?

A. Schottky

B. Frenkel

C. F-centre

D. Interstitial

**Answer: A**



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**123.** Solid  $CO_2$  is an example of:

A. Molecular crystal

B. Covalent crystal

C. Metallic crystal

D. Ionic crystal

**Answer: A**



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**124.** The three states of matter are solid, liquid and gas. Which of the following statements are correct about them ?

A. Gases and liquids have viscosity as a common property

B. The molecules in all the three states possess random translational motion

C. Gases cannot be converted into solids without passing through the liquid phase.

D. Solids and liquids have vapour pressure as a common property

**Answer: A**



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**125.** The intermetallic compound  $\text{LiAg}$  crystallises in cubic lattice in which both Li and Ag have co-ordination number of eight. The class of crystal is:

- A. Simple cubic
- B. Body centred cubic
- C. Face centred cubic
- D. None

**Answer: B**



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**126.** The number of atoms/molecules present in one body centred cubic unit cell is:

A. 1

B. 2

C. 4

D. 6

**Answer: B**



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**127.** Wax is an example of:

- A. Ionic crystal
- B. Covalent crystal
- C. Molecular crystal
- D. Metallic crystal

**Answer: C**



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**128.** In a crystal, the atoms are located at the position of.....potential energy.

A. Zero

B. Infinite

C. Minimum

D. Maximum

**Answer: C**





**129.** In a solid lattice the cation has left a lattice site and is located at an interstitial position. The lattice defect is known as -

- A. Interstitial defect
- B. Valency defect
- C. Frenkel defect
- D. Schottky defect

**Answer: C**



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130.  $CaF_2$  possesses:

- A. Face centred cubic
- B. Body centred cubic
- C. Simple cubic
- D. Hexagonal closed packing

**Answer: A**



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**131.** For an ionic crystal of the general formula  $A^+B^-$  and coordination number 6, the radius ratio will be:

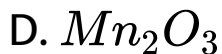
- A. Greater than 0.73
- B. Between 0.73 and 0.41
- C. Between 0.41 and 0.22
- D. Less than 0.22

**Answer: B**



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132. Which substance shows antiferromagnetism?



**Answer: D**



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**133.** The coordination number of  $Ca^{2+}$  ion in fluorite crystal is:

A. 2

B. 8

C. 6

D. 4

**Answer: B**



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**134.** Metals have conductivity of the order of ( $ohm^{-1}cm^{-1}$ ):

A.  $10^{12}$

B.  $10^5$

C.  $10^2$

D.  $10^{-6}$

**Answer: B**



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**135.** In crystal structure of rock salt (NaCl), the arrangement of  $Cl^-$  ion is:

A. fcc

B. bcc

C. Both (a) and (b)

D. None

**Answer: A**



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**136.** Which crystal is expected to be soft and have low melting point?

A. Covalent

B. Metallic

C. Molecular

D. Ionic

**Answer: A**



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**137.** The elements of symmetry in a crystal are:

- A. Plane of symmetry
- B. Axis of symmetry
- C. Centre of symmetry
- D. All

**Answer: D**



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**138.** Molecular crystals exist in:

A. Crystalline state

B. Amorphous state

C. Non-crystalline state

D. All

**Answer: D**



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**139.** Quartz is an example of:

A. ionic crystal

B. molecular crystal

C. metallic crystal

D. covalent crystal

**Answer: C**



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**140.** In antifluorite structure, the negative ions:

A. Occupy tetrahedral voids

B. Occupy octahedral voids

C. Are arranged in ccp

D. Are arranged in hcp

**Answer: C**



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**141.** The pure crystalline substance on being heated gradually first forms a turbid liquid at constant temperature and still at higher temperature turbidity completely disappears.

The behaviour is a characteristics of substance forming:

- A. Allotropic crystal
- B. Liquid crystal
- C. Isomeric crystals
- D. Isomorphous crystals

**Answer: B**



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**142.** Ionic solids with Schottky defects contain in their structure :

A. Equal number of cations and anion vacancies

B. Interstitial anions and anion vacancies

C. Cation vacancies only

D. Cation vacancies and interstitial cations

**Answer: A**



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**143.** In a cubic close packing of spheres in three dimensions the coordination number of each sphere is:

A. 6

B. 9

C. 3

D. 12

**Answer: D**



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144. When arrangement of electrons leads to ferromagnetism?

A.  $\uparrow \uparrow \uparrow \uparrow$

B.  $\uparrow \downarrow \uparrow \downarrow$

C.  $\uparrow \uparrow \uparrow \downarrow \downarrow$

D. None the these

**Answer: A**



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**145.** For which crystal anion-anion contact is valid?

A. NaF

B. NaI

C. CsBr

D. KCl

**Answer: A**



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**146.** The melting point of RbBr is  $682^{\circ}C$ , with that of *NaF* is  $988^{\circ}C$ . The principal reason that melting point of NaF is much higher than that of RbBr is that:

A. The two crystals are not isomorphous

B. The molar mass of NaF is smaller than that of RbBr

C. The internuclear distance  $r_e + r_a$  is greater for RbBr than for NaF

D. The bond in  $\text{RbR}$  has more covalent character than the bond in  $\text{NaF}$

**Answer: C**



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**147.** The oxide which shows metallic conduction:

A.  $\text{ReO}_3$

B.  $\text{VO}$

C.  $CrO_2$

D. All

**Answer: D**



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**148.** An insulator oxide is:

A. CuO

B. CoO

C.  $Fe_2O_3$

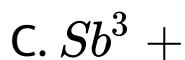
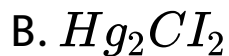
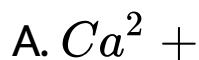
D. All

**Answer: D**



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**149.** Which species is diamagnetic?



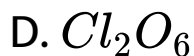
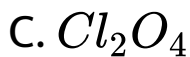
D. All

**Answer: D**



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**150.** Which oxide of chlorine is paramagnetic?



**Answer: B**



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151. Which crystal has the largest lattice energy?

A. KCl

B. MgO

C. LiBr

D. NaF

**Answer: B**



**152.** The structure of MgO is similar to NaCl.

The co-ordination number of Mg is:

A. 2

B. 6

C. 4

D. 8

**Answer: B**





**153.** 4 : 4 coordination is noticed in:

A. ZnS

B. CuCl

C. AgI

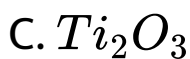
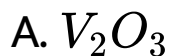
D. All

**Answer: D**



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**154.** The oxide which shows transition from metal to insulation, i.e., semiconductors are:



D. All

**Answer: D**



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155. 8 : 8 coordination is noticed in:

A. MgO

B.  $Al_2O_3$

C. CsCl

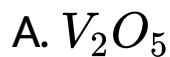
D. All

**Answer: C**



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156. The oxide that possesses electrical conductivity:



**Answer: B**



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157. In the unit-cell of NaCl lattice there are:

A.  $3\text{Na}^+$  ion

B.  $6\text{Na}^+$  ion

C.  $6\text{Cl}^-$  ion

D. 4NaCl units

**Answer: D**



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158. Which species is paramagnetic ?

A.  $Mn^{2+}$

B.  $NO$

C.  $Fe^{2+}$

D. All are correct

**Answer: D**



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**159.** The substance which possesses zero resistance as 0 K:

A. Conductor

B. Super conductor

C. Insulator

D. Semiconductor

**Answer: B**



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**160.** Of the elements Sr,Zr,Mo,Cd and Sb, all of which are in V period, the paramagnetics are:

A. Sr, Cd and Sb

B. Zr, Mo and Cd

C. Sr, Zr and Cd

D. Zr, Mo and Sb

**Answer: D**



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**161.** The cation-anion bond have the largest amount of covalent character for:



A. NaBr

B. SrS

C. CdS

D. BaO

**Answer: C**



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**162.** Which is ferromagnetic?

A. Ni

B. Co

C.  $CrO_3$

D. All

**Answer: D**

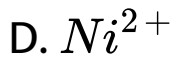


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**163.** Which one is diamagnetic?

A.  $ClO_2$

B.  $Cu^{2+}$



**Answer: C**



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**164.** Maximum ferromagnetism is found in:

A. Fe

B. Ni

C. Co

D. None

**Answer: A**



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**165.** Crystals can be classified into ..... basic crystal habits?

A. 7

B. 4

C. 14

D. 3

**Answer: A**



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**166.** The maximum proportion of available volume that can be filled by hard spheres in diamond is:

A. 0.52

B. 0.34

C. 0.32

D. 0.68

**Answer: B**



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**167.** Lubricating properties of graphite are diminished in presence of:

A. High pressure

B. Low pressure

C. Vacuum

D. None

**Answer: C**



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**168.** Which do not form amalgam with Hg ?

A. Pt

B. Fe

C. Both (a) and (b)

D. None

**Answer: C**



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**169.** High thermal conductivity of metals is due to transfer of heat through:

A. Molecular collisions

B. Electronic collisions

C. Atomic collisions



D. All

**Answer: B**



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**170.** The metal surfaces are excellent reflectors because of absorption and re-emission of light by:

A. Protons in atom

B. Electrons in atom

C. Neutrons in atom

D. None

**Answer: B**



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**171.** An increase in the charge of the positive ions that occupy lattice positions brings in a/an..... in methallic bonding.

A. Increase

B. Decrease

C. Neither increase nor decrease

D. Either increase or decrease

**Answer: A**



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**172.** The hardness of metal increases with increase in number of ..... involved in metallic bonding.

A. Atoms

B. Molecules

C. Electrons

D. All

**Answer: C**



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**173.** Which possesses highest lattice energy?

A. LiBr

B. LiCl

C. LiI

D. LiF

**Answer: D**



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**174.** Each atom in bcc structure has .....

Nearest neighbours.

A. 8

B. 6

C. 4

D. 2

**Answer: A**



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**175.** The resistance of mercury becomes almost zero at :

A. 4 K

B. 10 K

C. 20 K

D. 25 k

**Answer: A**



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**176.** All the substances become diamagnetic at

:

A. 4 K

B. 10 k

C. 20 K

D. 25 K

**Answer: A**



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**177.** Extremely pure samples of Ge and Si are non-conductors ,but their conductivity increases suddenly on introducing ..... In their crystal lattice .



A. As

B. B

C. Both(a) and (b)

D. None

**Answer: C**



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**178.** Solids are characterised by their properties :

- A. Incompressibility
- B. Mechanical strength
- C. Crystalline nature
- D. All

**Answer: D**



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**179.** A solid having no definite shape is called :

- A. Amorphous solid

B. Crystalline solid

C. Anisotropic

D. None

**Answer: A**



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**180.** A solid having no definite geometrical shape with flat faces and sharp edges is :

A. Amorphous solid

B. Crystalline solid

C. Isotropic solid

D. None

**Answer: B**



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**181.** The crystals are bounded by plane faces (f), straight edges (e) and interfacial angle (c).

The relationship between these is :

A.  $f+c = e+2$

B.  $f+e = c+2$

C.  $c+e = f+2$

D. None

**Answer: A**



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**182.** A cubic crystal possesses :

A. 9 Plane of symmetry

B. 13 axis of symmetry

C. 1 centre of symmetry

D. All

**Answer: D**



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**183.** A cubic crystal possesses in all .....

Elements of symmetry .

A. 9

B. 13

C. 1

D. 23

**Answer: D**



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**184.** The statement that , .. It is possible to choose along the three coordinate axes unit distance  $a, b, c$  not necessarily of the same length , such that the ratio of there intercepts

of any plane in the crystal ,is given by in ma :  
nb:pc where m,n,p are either integral whole  
numbers including infinity or fraction of whole  
number, ..is known as :

- A. Hauy's law of rationality of indices
- B. The law of constancy of interfacial angles
- C. The law of constancy of symmetry
- D. None

**Answer: A**







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**185.** The elements of symmetry in a crystal are:

- A. Hauy's law of rationality of indices
- B. The law of constancy of interfacial angles
- C. The law of constancy of symmetry
- D. None

**Answer: C**



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**186.** The statement that, .. That crystals of same substance can have different shapes depending upon the number and size of faces but the angle between the corresponding faces remains constant .. is known as :

A. Hauy's law of rationality of indices

B. The law of constancy of interfacial angles

C. The law of constancy of symmetry

D. None

**Answer: B**



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**187.** The ratio of cations to anion in a octahedral close packing is :

A. 0.414

B. 0.225

C. 0.02

D. None

**Answer: A**



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**188.** The ratio of cations to anion in a closed pack tetrahedral is :

A. 1

B. 0.225

C. 0.02

D. None

**Answer: B**



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**189.** If  $a$  is the length of unit cell .then which one is correct relationship :

A. For simple cubic lattice, Radius of metal

$$\text{atom} = a/2$$

B. For bcc lattice,

$$\text{Radius of metal atom} = \frac{\sqrt{3}a}{4}$$

C. For fcc lattice,

$$\text{Radius of metal atom} = \frac{a}{2\sqrt{2}}$$

D. All

**Answer: D**



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**190.** An amorphous solid is:

A. Possess sharp melting points

B. Undergo clean cleavage when cut with  
knife

C. Do not undergo clean cleavage when cut  
with knife

D.

**Answer: C**



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**191.** Which of the following will show anisotropy?

A. Glass

B. NaBr`

C. plastic

D. rubber

**Answer: B**



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192. The unit cell with crystallographic dimensions  $a = b \neq c$ ,  $\alpha = \beta = \gamma = 90^\circ$  is

A. Cubic

B. Tetragonal

C. Monoclinic

D. Hexagonal

**Answer: B**



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**193.** The arrangement ABC, ABC ... is referred to as

- A. Octahedral close packing
- B. Hexagonal close packing
- C. Tetrahedral close packing
- D. Cubic close packing

**Answer: D**



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**194.** The interparticle forces in solid hydrogen are :

- A. Hydrogen bonds
- B. Covalent bonds
- C. Coordinate bonds
- D. van der Waals .forces

**Answer: D**



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**195.** A solid X melts slightly above 273 K and is a poor conductor of heat and electricity. To which of the following categories does it belong :

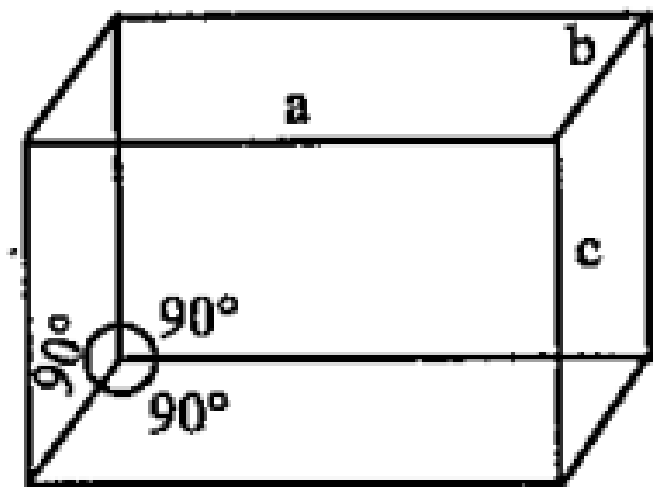
- A. Ionic solid
- B. Covalent solid
- C. metallic
- D. Molecular

**Answer: D**



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196. The unit cell with the structure below refers to ..... Crystal system.



- A. Cubic
- B. Orthorhombic
- C. Tetragonal

## D. Trigonal

**Answer: B**

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**197.** Find  $f(\sqrt{2})$  and  $f(-\sqrt{3})$  for the function

$$f(x) = \begin{cases} x^2, & \text{if } x < 0 \\ x, & \text{if } 0 \leq x \leq 1 \\ \frac{1}{x}, & \text{if } x > 1. \end{cases}$$

A.  $AB$

B.  $AB_2$

C.  $A_2B$

D.  $A_3B_4$

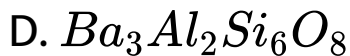
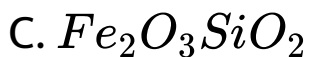
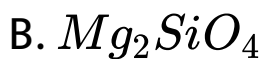
**Answer: C**



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**198.** The example of ortho silicate is :

A.  $MgCaSi_2O_6$



**Answer: B**



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**199.** A binary solid ( $A^+ B^-$ ) has a zinc blende structure with  $B^-$  ions constituting the lattice and  $A^+$  ions occupying 25% tetrahedral holes. The formula of solid is :



A.  $AB$

B.  $A_2B$

C.  $AB_2$

D.  $AB_4$

**Answer: C**



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**200.** The radius of  $Na^+$  is 95 pm and  $Cl^-$  ion 181 pm. Find co-ordination number of  $Na^+$  ion.

A. 4

B. 6

C. 8

D. Unpredictable

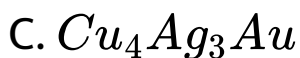
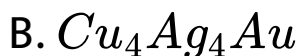
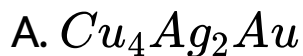
**Answer: B**



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**201.** An alloy of copper, silver and gold is found to have copper constituting the ccp lattice . If silver atoms occupy the edge centre and gold

is present at body centre, the alloy has a formula :



**Answer: C**



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202. Which is an example of ferroelectric compound ?

A. Quartz

B.  $PbCrO_4$

C. Barium titanate

D. None

**Answer: C**



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203. Which one is called pseudo solid ?

A.  $CaF_2$

B. Glass

C. NaCl

D. All

**Answer: B**



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**204.** The yellow colour of ZnO and conducting nature produced in heating is due to :

A. Meta excess defects due to interstitial cation

B. Extra positive ions present in an interstitial site

C. Trapped electrons

D. All

**Answer: D**



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205. The phenomenon in which crystals on subjecting to a pressure or mechanical stress produce electricity is called :

- A. Pyroelectricity
- B. Piezoelectric effect
- C. Ferro electricity
- D. Ferri electricity

**Answer: B**



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**206.** The phenomenon in which polar crystals on heating produce electricity is called :

- A. Pyroelectricity
- B. Piezoelectricity
- C. Ferro electricity
- D. Ferri electricity

**Answer: A**





207. silicon doped with arsenic is an example of :

A. p-type conductor

B. n-type conductor

C. both

D. None

**Answer: B**



**208.** The number of octahedral sites in a cubical close pack array of  $N$  spheres is :

A.  $N/2$

B.  $2N$

C.  $4N$

D.  $N$

**Answer: D**



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**209.** In a close pack array of  $n$  spheres, the number of tetrahedral holes are :

A.  $4N$

B.  $N/2$

C.  $2N$

D.  $N$

**Answer: C**



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**210.** The coordination number of a metal crystallising in a hexagonal close-packed structure is :

A. 12

B. 4

C. 8

D. 6

**Answer: A**



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**211.** In a cubic close packing of spheres in three dimensions the coordination number of each sphere is:

A. 6

B. 9

C. 3

D. 12

**Answer: D**



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212. If the position of  $Na^+$  and  $Cl^-$  are interchanged in NaCl, the crystal lattice with respect to  $Na^+$  and  $Cl^-$  is :

- A. Both fcc
- B. Both bcc
- C. fcc and bcc
- D. bcc and fcc

**Answer: A**



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**213.** Which of the following statement is not correct ?

A. The coordination number of each type of ion in CsCl crystal is 8.

B. A metal that crystallises in bcc structure has a coordination no .of 12.

C. A unit cell of an ionic crystal shares some of its ions with other unit cells .

D. The length of the unit cell in NaCl is 552

pm ( $rNa^+ = 95 \pm$  ,  $rCl^- = 181 \pm$  ) .

**Answer: B**

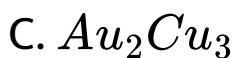
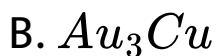
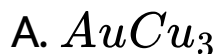


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**214.** A compound alloy of gold and Cu crystallises in a cubic lattice in which the gold atoms occupy the lattice points at the corners of a cube and the copper atoms occupy the



centres of each of the cube faces. What is the empirical formula of this compound ?



**Answer: A**



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**215.** The intermetallic compound LiAg has a cubic crystalline structure in which each Li atom has 8 nearest neighbour silver atoms and vice-versa .What is the type of unit cell ?

A. Body-centred cubic

B. Face-centred cubic

C. Simple cubic for either Li atoms alone or  
Ag atoms alone

D. None of the above

**Answer: A**



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**216.** How many tetrahedral holes are occupied in diamond ?

A. 25 %

B. 50 %

C. 75 %

D. 100 %

**Answer: B**



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**217.** How many octahedral and tetrahedral holes are present per unit cell in a face-centred cubic arrangement of atoms?

A. 8,4

B. 1,2

C. 4,8

D. 2,1

**Answer: C**



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**218.** When arrangement of electrons leads to ferromagnetism?

A.  $\uparrow \uparrow \uparrow \uparrow$

B.  $\uparrow \uparrow \uparrow \uparrow$

C. Both (a) and (b)

D. None

**Answer: B**



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**219.** How many .nearest. and. next nearest. neighbours respectively potassium have in bcc lattice ?

A. 8,8

B. 8,6

C. 6,8

D. 8,2

**Answer: B**



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**220.** Ferrimagnetic is converted into ferromagnetic at :

A. 300 K

B. 400 K

C. 600 K

D. 850 K

**Answer: D**



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**221.** Bragg's equation is:

A.  $n\lambda = 2 \sin \theta$

B.  $n\lambda = 2d \sin \theta$

C.  $2d = n\lambda \sin \theta$

D.  $n\lambda = d \sin \theta$

**Answer: B**





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222. Fraction of the total volume occupied by atoms in a simple cube is :

A.  $\frac{\pi}{2}$

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

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

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

**Answer: D**



**223.** The number of atoms ( $n$ ) contained within a cubic cell is :

A. 1

B. 2

C. 3

D. 4

**Answer: A**



**224.** The number of atoms/molecules present in one body centred cubic unit cell is:

A. 1

B. 2

C. 3

D. 4

**Answer: B**



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225. The number of atoms/molecules contained in one face centred cubic unit cell of a monoatomic substance is:

A. 1

B. 2

C. 3

D. 4

**Answer: D**



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**226.** A compound formed by elements A and B crystallizes in cubic structure where A atoms are at the corners of a cube and B atoms are at the face centre. The formula of the compound is :



D. None of these

**Answer: A**



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227. A fcc element (atomic mass =60) has a cell edge of 400pm. Its density is :

A.  $6.23gcm^{-3}$

B.  $6.43gcm^{-3}$

C.  $6.53gcm^{-3}$

D.  $6.63gcm^{-3}$

**Answer: A**



228. A compound  $\text{CuCl}$  has face centred cubic structure. Its density is  $3.4\text{gcm}^{-3}$ . The length of unit cell is :

A.  $5.783\text{\AA}$

B.  $6.783\text{\AA}$

C.  $7.783\text{\AA}$

D.  $8.783\text{\AA}$

**Answer: A**



229. The density of KCl is  $1.9893\text{gcm}^{-3}$  and the length of a side unit is  $6.29082\text{\AA}$  as determined by X-Rays diffraction. The value of Avogadro's number calculated from these data is :

A.  $6.017 \times 10^{23}$

B.  $6.023 \times 10^{23}$

C.  $6.03 \times 10^{23}$

D.  $6.017 \times 10^{19}$



**Answer: A**



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**230.** A unit cell cube length for LiCl (just like NaCl structure) is  $5.14\text{\AA}$ . Assuming anion-anion contact, the ionic radius for chloride ion is :

A.  $1.815\text{\AA}$

B.  $2.8\text{\AA}$

C.  $3.8\text{\AA}$

D.  $4.815\text{\AA}$

**Answer: A**



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**231.** At room temperature, sodium crystallizes in a body centred cubic lattice with  $a = 4.24\text{\AA}$ . The theoretical density of sodium (At.wt. of Na=23) is:

A.  $1.002\text{gcm}^{-3}$

B.  $2.002\text{gcm}^{-3}$

C.  $3.002\text{gcm}^{-3}$

D. None of these

**Answer: A**



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**232.** Lithium borohydride crystallizes in an orthorhombic system with 4 molecule per unit cell .The unit cell dimensions are  $a = 6.8\text{\AA}$ ,  $b = 4.4\text{\AA}$  and  $c = 7.2\text{\AA}$ .If the

molar mass is 21.76 then the density of crystals

is :

A.  $0.6708 \text{gcm}^{-3}$

B.  $1.6708 \text{gcm}^{-3}$

C.  $2.6708 \text{gcm}^{-3}$

D. None

**Answer: A**



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233. Sodium metal crystalizes in a body centred cubic lattice with the cell edge  $a = 4.29\text{\AA}$ . The radius of sodium atom is :

A.  $1.8574\text{\AA}$

B.  $2.8574\text{\AA}$

C.  $3.8574\text{\AA}$

D. None

**Answer: A**



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**234.** A solid compound  $X Y$  has NaCl structure. If radius of  $X^+$  is 100 pm . What is the radius of  $Y^-$  ion:

- A. 120 pm
- B. 321.6 pm
- C. 136.6 pm
- D. 241.6 pm

**Answer: B**



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**235.** If 'a' is the edge length of the unit cell of a fcc crystal, then what is the distance of closest approach between the two atoms in the crystal ?

A.  $200 \text{ pm}$

B.

C.  $142.2 \text{ pm}$

D.

**Answer: A**



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**236.** A binary solid ( $A^+ B^-$ ) has a rock salt structure. If the edge length is 400 pm and radius of cation is 80 pm the radius of anion is :

- A. 120 pm
- B. 125 pm
- C. 250 pm
- D. 325 pm



**Answer: B**



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**237.** The ionic radii of  $Rb^+$  and  $I^-$  are  $1.46\overset{\circ}{\text{Å}}$  and  $2.16\overset{\circ}{\text{Å}}$ . The most probable type of structure exhibited by it is :

A. CsCl type

B. NaCl type

C. ZnS type

D.  $CaF_2$  type

**Answer: B**



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**238.** The density of KBr is  $2.75 \text{ gm cm}^{-3}$   
length of the unit cell is 654 pm . K=39,Br=80,  
then what is true about the predicted nature  
of the solid:

A. Solid has face centred cubic system with  
coordination number=6

B. Solid has simple cubic system with  
coordination number =4

C. Solid has face centred cubic system with  
coordination number =4

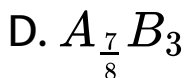
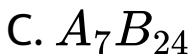
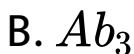
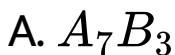
D. None

**Answer: A**



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**239.** In a face centred cubic arrangement of A and B atoms whose A atoms are at the corner of the unit cell and B atoms at the face centres: One of the A atom is missing from one corner in unit cell . The simplest formula of compound is :



**Answer: C**



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**240.** The radius of  $Ag^+$  ion is 126 pm while that of  $I^-$  ion is 216 pm . The coordination number of Ag in AgI is :

A. 2

B. 4

C. 6

D. 8

**Answer: C**



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**241.** CsBr has bcc structure with edge length 4.3. The shortest inter ionic distance in between  $Cs^+$  and  $Br^-$  is :

A. 3.72

B. 1.86

C. 7.44

D. 4.3

**Answer: A**



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**242.** Edge length of a cube is 400 pm. Its body diagonal would be :

A. 600 pm

B. 566 pm

C. 693 pm

D. 500 pm

**Answer: C**



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**243.** IN a sodium chloride crystal, each chloride ion is surrounded by :

- A. 6 sodium ions
- B. 6 chloride ions
- C. 8 sodium ions
- D. 4 sodium ions



**Answer: A**



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**244.** The structure of NaCl crystal is :

- A. Body centred cubic lattice
- B. Face centred cubic lattice
- C. Octahedral
- D. Square planar

**Answer: B**



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**245.** The total number of atoms per unit cell of a face centred cubic crystal is

- A. 2
- B. 3
- C. 4
- D. 14

**Answer: C**



**246.** A crystal may have one or more planes of symmetry as well as one or more axes of symmetry but it has :

- A. Two centres of symmetry
- B. No centre of symmetry
- C. One centre of symmetry
- D. Four centres of symmetry

**Answer: C**



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247. The total number of symmetry in a cubic crystal is :

A. 9

B. 23

C. 10

D. None

**Answer: B**



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**248.** The structure of CsCl crystal is:

A. Body centred cubic lattice

B. Face centred cubic lattice

C. Octahedral

D. None

**Answer: A**



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**249.** Close packing is maximum in the crystal which is -

- A. Simple cube
- B. Face centred cube
- C. Body centred cube
- D. none

**Answer: B**



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250. The number of atoms per unit cell in a simple cube, face centred cube and body centred cube are respectively:

A. 1,4,2

B. 1,2,4

C. 8,14,9

D. 8,4,2

**Answer: A**



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**251.** The coordination number of a body centred atom is:

A. 4

B. 6

C. 8

D. 12

**Answer: C**



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252. Bragg's equation has no solution if:

A.  $n\lambda = 2d$

B.  $n\lambda > 2d$

C.  $n\lambda < 2d$

D. All

**Answer: B**



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253. In a body centred cubic arrangement the ion A occupies the centre while the ions B occupy the corners of a cube the formula of the crystal is:

A. AB

B.  $A_2B$

C.  $AB_2$

D.  $AB_3$

**Answer: A**



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**254.** A crystalline solid

- A. Isotropic
- B. Sharp melting point
- C. Definite geometry
- D. High intarmolecular forces

**Answer: A**



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**255.** The number of Bravais lattices in a cubic crystal is:

A. 3

B. 1

C. 4

D. 14

**Answer: A**



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256. The volume occupied by an atom in a simple cubic unit cell is:

A.  $a^3$

B.  $\frac{4\pi a^3}{3}$

C.  $\frac{\pi a^3}{6}$

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

**Answer: C**



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257. The atomic radius of a body centred cubic cell is:

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

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

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

D.  $\frac{a}{4}$

**Answer: B**



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**258.** Iron crystallizes in a body centred cubic structure. Calculate the radius of Fe if edge length of unit cell is 286 pm.



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**259.** In a face centred cubic crystal of an element, if the edge length of the unit cell is 580 pm, calculate the nearest neighbour distance and radius of the atom



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**260.** In a bcc crystal of a metal having atomic mass 55, if its edge length is 291 picometer, calculate the density of crystal.



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**261.** Which state of matter has definite mass, volume and shape ?



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**262.** What is amorphous solid ?



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**263.** Which solids behave like super cooled liquid ?



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**264.** Which type of solids have long range order and sharp melting point ?



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**265.** What are the different categories of crystalline solids ?



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**266.** Which factors influence the properties Of crystallinesolids ?



**Watch Video Solution**

**267.** Give an example of hcp and bcc crystals.



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**268.** What is the coordination number of each sphere in hexagonal close packed structure.



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**269.** What is the coordination number of each sphere in :

Body-centred cubic structure.



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**270.** What is the coordination number of each ion in NaCl ?



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**271.** What are the coordination numbers of  $Cs^+$  and  $Cl^-$  in CsCl lattice ?



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**272.** What is the formula of density ( $d$ ) of unit cell ?



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**273.** What is called crystal lattice ?



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**274.** What is unit cell ?



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**275.** How many types of primitive unit cells are there ?



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**276.** Name two most efficient close packed lattices.



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**277.** Give two examples of amorphous solid.



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**278.** What is the arrangement of atom/ions in bcc ?



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**279.** What is the radius ratio range ( $r^+ / r^-$ ) for ionic solids with bcc structure ?





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**280.** What is the co-ordination number of  $Ca^{2+}$  and  $F^{-}$  ions in  $CaF_2$  lattice ?



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**281.** What is the coordination number of each sphere in hexagonal close packed structure.



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**282.** What is the coordination number of each atom in ccp structure?



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**283.** What is co-ordination number of each sphere in bcc packed structure ?



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**284.** \_\_\_\_\_ solids are isotropic in nature.



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285. \_\_\_\_\_ solids are anisotropic in nature.



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286. In most close-packed lattices, \_\_\_\_\_ % of space is filled.



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287. Cubic close-packed (ccp) lattice is also called\_\_\_\_\_



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288. Two types of voids are \_\_\_\_\_ and \_\_\_\_\_



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289. Iodine is \_\_\_\_\_ type solid.



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290. Ice is an example of \_\_\_\_\_ type crystal



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291. Two examples of covalent crystals are \_\_\_\_\_ and \_\_\_\_\_



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**292.** Crystal structure of CsCl is of \_\_\_\_ type.

(fcc, bcc, hcp)



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**293.** In simple ionic crystals \_\_\_\_ or \_\_\_\_ types of arrangement are generally -present.



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**294.** In ionic crystals \_\_\_\_\_ ions adopt ccp or hcp arrangement, while \_\_\_\_\_ ions occupy interstitial sites



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**295.** In NaCl crystal \_\_\_\_\_ ions occupy all the octahedral sites.



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**296.** Co-ordination numbers of  $Cs^+$  and  $Cl^-$  in CsCl crystal are in the ratio ?



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**297.** In NaCl crystal, one  $Na^+$  ion is surrounded by \_\_\_\_  $Cl^-$  ions.



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**298.** Two metals showing cubic close packed (ccp) structure are \_\_\_\_\_ and \_\_\_\_\_



**Watch Video Solution**

**299.** Two metals exhibiting hcp arrangement are \_\_\_\_\_ and \_\_\_\_\_



**Watch Video Solution**



**300.** In ionic crystals \_\_\_\_\_ ions adopt ccp or hcp arrangement, while \_\_\_\_\_ ions occupy interstitial sites



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**301.** The number of nearest neighbours with which a given sphere is in contact is called \_\_\_\_\_



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**302.** If radius ratio ( $r^+ / r^-$ ) is in the range 0.414 to 0.732, the possible co-ordination number is \_\_\_\_\_ and structural arrangement is \_\_\_\_\_



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**303.** Zinc blende type structure has \_\_\_\_\_ co-ordination, while cesium chloride type, structure has \_\_\_\_\_ co-ordination.



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**304.** Carborandum and dry ice are \_\_\_\_\_ and \_\_\_\_\_ type of crystal respectively



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**305.** Co-ordination numbers of  $Cs^+$  and  $Cl^-$  in CsCl crystal are in the ratio ?



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**306.** Zinc blende type structure has what coordination ratio?



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**307.** Iodine is an ionic type solid.



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**308.** In most close-packed lattices, \_\_\_\_\_ % of space is filled.



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**309.** Cubic close-packed (ccp) lattice also called bcc is it true or false?



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**310.** Why solids have definite mass, volume and shape ?



[Watch Video Solution](#)

**311.** What are Bravais Lattices ?



**Watch Video Solution**

**312.** Name two most efficient close packed lattices.



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**313.** How can you convert NaCl structure to CsCl structure and vice versa ?





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**314.** What are the common types of defects in solids ?



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**315.** What are different types of points defects ?



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**316.** Distinguish between anisotropy and isotropy.



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**317.** Calculate the number of atoms contained within face-centred cubic cm.



**Watch Video Solution**

**318.** Predict the percentage of space filled by particles in bcc





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**319.** Predict the percentage of space filled by particles in bcc



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**320.** Predict the percentage of space filled by particles in simple cubic lattice.



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**321.** Define unit cell and 'space lattice'. What do you understand by simple, face-centred and body-centred unit cell.



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**322.** Briefly describe the main features of each of the different types of structures of the ionic compounds of the type AB.



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**323.** Briefly describe how the packing of the constituent particles in a crystal takes place.



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**324.** What is meant by radius ratio ? How is it helpful in determining the geometry of the ionic solid ?



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**325.** Give the difference between crystalline solids and amorphous solids?



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**326.** On the basis of the nature of bonding how can solids be classified into different types ?



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**327.** Explain fcc and bcc type of crystal structure and describe their characteristics.



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**328.** Describe the characteristics of hexagonal close packed structure giving examples.



**Watch Video Solution**

**329.** Giving only the example describe, the crystal of some simple ionic compounds.



**Watch Video Solution**

**330.** Briefly describe various types of point defects with examples.



**Watch Video Solution**

**331.** Explain electrical properties of solids using band theory.



**Watch Video Solution**

**332.** Briefly explain various types of magnetic properties of solids



**Watch Video Solution**

**333.** Discuss the formation of n-type semiconductors,



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**334.** Discuss the formation of p-type semiconductors,



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**335.** An amorphous solid is:



A. Diamond

B. Graphite

C. Glass

D. Common salt

**Answer: C**



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**336.** The number of basic crystal systems are:

A. 7

B. 8

C. 6

D. 4

**Answer: A**



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**337.** Bragg's equation is:

A.  $n\lambda = 2\theta \sin \theta$

B.  $n\lambda = 2d \sin \theta$

$$C. 2n\lambda = d \sin \theta$$

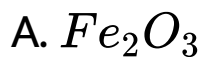
$$D. \lambda = \left(2 \frac{d}{n}\right) \sin \theta$$

**Answer: B**



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**338.** Which is/are covalent solid:



B. Diamond

C. Graphite

D. All

**Answer: D**



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**339.** Graphite is an example of:

A. Ionic solid

B. Covalent solid

C. Van der Waal's crystal

D. Methallic crystal

**Answer: B**



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**340.** The number of atoms/molecules contained in one face centred cubic unit cell of a monoatomic substance is:

A. 4

B. 6

C. 8

D. 12

**Answer: A**



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**341.** The number of atoms present in a simple cubic unit cell are:

- A. 4
- B. 3
- C. 2
- D. 1

**Answer: D**



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**342.** The rank of a cubic unit cell is 4. The type of cell as:

A. Body centred

B. Face centred

C. Primitive

D. None

**Answer: B**



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**343.** 8 : 8 coordination is noticed in:

- A. Applying pressure
- B. Increasing temperature
- C. Both (a) and (b)
- D. None

**Answer: B**





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**344.** In a crystal some ions are missing from normal sites This is an example of:

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

**Answer: D**



345. Among the following type of voids, which one is the largest void:

- A. Triangular
- B. Cubic
- C. Tetrahedral
- D. Octahedral

**Answer: D**



346.  $TiO_2$  is well known example of

- A. Triclinic system
- B. Tetragonal system
- C. Monoclinic system
- D. None

**Answer: B**



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**347.** Ionic salts on dissolution in a solvent shows:

- A. A decrease in the viscosity of the liquid
- B. An increase in the viscosity of the liquid
- C. No effect on the viscosity of the liquid
- D. None

**Answer: A**



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**348.** Ionic solids are characterised by:

A. Good conductivity in solid state

B. High vapour pressure

C. Low melting point

D. Solubility in polar solvents

**Answer: D**



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**349.** Each unit cell of NaCl consists of 4 chloride ions and:

A. 13 Na atoms

B. 4 Na ions

C. 6 Na atoms

D. 8 Na atoms

**Answer: B**



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**350.** Silicon dioxide is an example of:

- A. Metallic crystal
- B. Ionic crystal
- C. Covalent crystal
- D. None

**Answer: C**



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**351.** Crystals which are good conductor of heat and electricity are -

- A. Ionic crystals
- B. Covalent crystals
- C. Metallic crystals
- D. Molecular crystals

**Answer: C**



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**352.** LiF is a/an:

- A. Ionic crystal
- B. Metallic crystal
- C. Covalent crystal
- D. Molecular crystal

**Answer: A**



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**353.** The structure of CsCl crystal is:

A. Body centred cubic lattice

B. Face centred cubic lattice

C. Octahedral lattice

D. None

**Answer: A**



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**354. ZnS is:**

A. Ionic crystal

B. Covalent crystal

C. Metallic crystal

D. van der Waals crystal

**Answer: A**



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**355.** In graphite crystal, carbon is:

A.  $sp$ -hybridised

B.  $sp^2$  – hybridised

C.  $sp^3$  – hybridised

D. None

**Answer: B**



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**356.** In diamond carbon is.....hybridised.

A.  $sp$

B.  $sp^2$

C.  $sp$

D. None

**Answer: C**



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**357.**  $Na_2SeO_4$  and  $NaSO_4$  show:

A. Isomorphism

B. Polymorphism

C. Allotropism

D. Ferromagnetism

**Answer: A**



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**358.** A crystal of  $Fe_3O_4$  is:

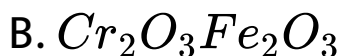
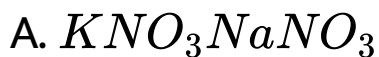
- A. Paramagnetic
- B. Diamagnetic
- C. Ferromagnetic
- D. None

**Answer: C**



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359. Which one is correct about ferrites?



C. Both (a) and (b)

D. None

**Answer: B**



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**360.** Which one is correct about ferrites?

- A. These possess formula  $AB_2O_4$  (where A is divalent and B is trivalent cation)
- B. These possess spinel structure
- C.  $MgAl_2O_4$  is a ferrite
- D. All

**Answer: D**



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**361.** The structure of sodium chloride is

A. Body centred cubic lattice

B. Face centred cubic lattice

C. Octahedral

D. Square planar

**Answer: B**



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**362.** Most crystals show good cleavage

because their atoms, ions and molecules are:

A. Weakly bonded together

B. Strongly bonded together

C. Spherically symmetrical

D. Arranged in planes

**Answer: D**



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**363.** Which of the following statements are true?

A. Piezoelectricity is due to net dipole moment

B. Ferroelectricity is due to alignment of dipoles in same direction

C. Pyroelectricity is due to heating polar crystals

D. All

**Answer: D**



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**364.** Frenkel defect is noticed in:

A. AgBr

B. ZnS

C. AgI

D. All

**Answer: D**



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**365.** Schottky defect is noticed is:

A. NaCl

B. KCl

C. CsCl

D. All

**Answer: D**



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**366.** In a body centred cubic cell, an atom at the body of centre is shared by:

- A. 1 unit cell
- B. 4 unit cells
- C. 3 unit cells
- D. 2 unit cells

**Answer: A**



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**367.** In a simple cubic cell, each atom on a corner is shared by:

A. 2 unit cells

B. 1 unit cell

C. 8 unit cells

D. 4 unit cells

**Answer: C**



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**368.** In a face centred cubic cell, an atom at the face centre is shared by:

A. 4 unit cells

B. 2 unit cell

C. 1 unit cells

D. 6 unit cells

**Answer: B**



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369. When arrangement of electrons leads to ferromagnetism?

A.  $\uparrow \uparrow \uparrow \downarrow \downarrow$

B.  $\uparrow \downarrow \uparrow \downarrow$

C.  $\uparrow \uparrow \uparrow \downarrow \downarrow \downarrow \downarrow$

D. None

**Answer: C**



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**370.** The number of  $Na^+$  ions which surrounds each  $Cl^-$  ion in the NaCl crystal lattice is:

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

**Answer: B**



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371. The mass of a unit cell of CsCl corresponds to:



**Answer: C**



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**372.** The coordination number of a body centred atom is:

A. 4

B. 6

C. 8

D. 12

**Answer: C**



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**373.** In a face centred cubic lattice the number of nearest neighbours for a given lattice point are:

A. 6

B. 8

C. 12

D. 14

**Answer: C**



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**374.** Close packing is maximum in the crystal which is -

A. Simple cubic

B. Face centred

C. Body centred

D. None

**Answer: B**



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**375.** Which is (are) amorphous solids?

A. Rubber

B. Plastics

C. Glass

D. All

**Answer: D**



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**376.** Iodine crystals are:

A. Metallic solid

B. Ionic solid

C. Molecular solid

D. Covalent solid

**Answer: C**



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**377.** The number of molecules of NaCl in an unit cell of its crystal is:



A. 2

B. 4

C. 6

D. 8

**Answer: B**



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**378.** The coordination number of a body centred atom is:

A. 2

B. 6

C. 4

D. 8

**Answer: C**



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**379.** The ratio of closed packed atoms to tetrahedral holes in cubic close packing is:

A. 1 : 1

B. 1 : 2

C. 1 : 3

D. 2 : 1

**Answer: B**



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**380.** How many kinds of space lattices are possible in a crystal?

A. 23

B. 7

C. 230

D. 14

**Answer: D**



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**381.** The vacant space in body centred cubic lattice bcc unit cell is about:

A. 32 %

B. 10 %

C. 23 %

D. 46 %

**Answer: A**



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**382.** A match box exhibits:

A. Cubic geometry

B. Monoclinic geometry

C. Orthorhombic geometry

D. Tetragonal geometry

**Answer: C**



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**383.** Which point defect in crystals of a solid decreases the density of the solid ?

A. Schottky

B. Frenkel

C. F-centre

D. Interstitial

**Answer: A**



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**384.** Solid  $CO_2$  is an example of:

A. Molecular crystal

B. Covalent crystal

C. Metallic crystal

D. Ionic crystal

**Answer: A**



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**385.** The three states of matter are solid, liquid and gas. Which of the following statements are correct about them ?



A. Gases and liquids have viscosity as a common property

B. The molecules in all the three states possess random translational motion

C. Gases cannot be converted into solids without passing through the liquid phase.

D. Solids and liquids have vapour pressure as a common property

**Answer: A**



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**386.** The intermetallic compound  $\text{LiAg}$  crystallises in cubic lattice in which both Li and Ag have co-ordination number of eight. The class of crystal is:

- A. Simple cubic
- B. Body centred cubic
- C. Face centred cubic
- D. None

**Answer: B**



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**387.** The number of atoms/molecules present in one body centred cubic unit cell is:

A. 1

B. 2

C. 4

D. 6

**Answer: B**



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**388.** Wax is an example of:

- A. Ionic crystal
- B. Covalent crystal
- C. Molecular crystal
- D. Metallic crystal

**Answer: C**



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**389.** In a crystal, the atoms are located at the position of.....potential energy.

A. Zero

B. Infinite

C. Minimum

D. Maximum

**Answer: C**



**390.** In a solid lattice the cation has left a lattice site and is located at an interstitial position. The lattice defect is known as -

- A. Interstitial defect
- B. Valency defect
- C. Frenkel defect
- D. Schottky defect

**Answer: C**



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391.  $CaF_2$  possesses:

- A. Face centred cubic
- B. Body centred cubic
- C. Simple cubic
- D. Hexagonal closed packing

**Answer: A**



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**392.** For an ionic crystal of the general formula  $A^+B^-$  and coordination number 6, the radius ratio will be:

- A. Greater than 0.73
- B. Between 0.73 and 0.41
- C. Between 0.41 and 0.22
- D. Less than 0.22

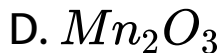
**Answer: B**



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393. Which substance shows antiferromagnetism?



**Answer: D**



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**394.** The coordination number of  $Ca^{2+}$  ion in fluorite crystal is:

A. 2

B. 8

C. 6

D. 4

**Answer: B**



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395. Metals have specific conductivity of the order of ( $\text{ohm} - 1\text{cm} - 1$ ):

A.  $10^{12}$

B.  $10^8$

C.  $10^2$

D.  $10^{-6}$

**Answer: B**



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**396.** In crystal structure of rock salt (NaCl), the arrangement of  $Cl^-$  ion is:

A. fcc

B. bcc

C. Both (a) and (b)

D. None

**Answer: A**



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**397.** Which crystal is expected to be soft and have low melting point?

A. Covalent

B. Methalic

C. Molecular

D. Ionic

**Answer: A**



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**398.** The elements of symmetry in a crystal are:

- A. Plane of symmetry
- B. Axis of symmetry
- C. Centre of symmetry
- D. All

**Answer: D**



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**399.** Molecular crystals exist in:

A. Crystalline state

B. Amorphous state

C. Non-crystalline state

D. All

**Answer: D**



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**400.** Quartz is an example of:

A. Chain silicate

B. Infinite sheet silicate

C. Framework silicate

D. Cyclic silicate

**Answer: C**



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**401.** In antifluorite structure, the negative ions:

A. Occupy tetrahedral voids



B. Occupy octahedral voids

C. Are arranged in ccp

D. Are arranged in hcp

**Answer: C**



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**402.** The pure crystalline substance on being heated gradually first forms a turbid liquid at constant temperature and still at higher temperature turbidity completely disappears.

The behaviour is a characteristics of substance forming:

- A. Allotropic crystal
- B. Liquid crystal
- C. Isomeric crystals
- D. Isomorphous crystals

**Answer: B**



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**403.** Ionic solids with Schottky defects contain in their structure:

- A. Equal number of cations and anion vacancies
- B. Interstitial anions and anion vacancies
- C. Cation vacancies only
- D. Cation vacancies and interstitial cations

**Answer: A**



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**404.** In a cubic close packing of spheres in three dimensions the coordination number of each sphere is:

A. 6

B. 9

C. 3

D. 12

**Answer: D**



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405. When arrangement of electrons leads to ferromagnetism?

A.  $\uparrow \uparrow \uparrow \uparrow$

B.  $\uparrow \downarrow \uparrow \downarrow$

C.  $\uparrow \uparrow \uparrow \downarrow \downarrow$

D. None the these

**Answer: A**



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**406.** For which crystal anion-anion contact is valid?

A. NaF

B. NaI

C. CsBr

D. KCl

**Answer: A**



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407. The melting point of RbBr is  $682^{\circ}C$ , with that of *NaF* is  $988^{\circ}C$ . The principal reason that melting point of NaF is much higher than that of RbBr is that:

A. The two crystals are not isomorphous

B. The molar mass of NaF is smaller than that of RbBr

C. The internuclear distance  $r_e + r_a$  is greater for RbBr than for NaF

D. The bond in  $RbR$  has more covalent character than the bond in  $NaF$

**Answer: C**



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**408.** The oxide which shows metallic conduction:

A.  $ReO_3$

B.  $VO$



C.  $CrO_2$

D. All

**Answer: D**



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**409.** An insulstor oxide is:

A.  $CuO$

B.  $CoO$

C.  $Fe_2O_3$

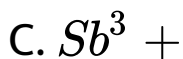
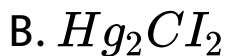
D. All

**Answer: D**



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**410.** Which species is diamagnetic?



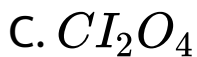
D. All

**Answer: D**



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**411.** Which oxide of chlorine is paramagnetic?



**Answer: B**



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412. Which crystal has the largest lattice energy?

A. KCl

B. MgO

C. LiBr

D. NaF

**Answer: B**



**413.** The structure of  $\text{MgO}$  is similar to  $\text{NaCl}$ .

The co-ordination number of  $\text{Mg}$  is:

A. 2

B. 6

C. 4

D. 8

**Answer: B**



**414.** 4 : 4 coordination is noticed in:

A. ZnS

B. CuCl

C. AgI

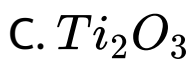
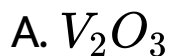
D. All

**Answer: D**



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**415.** The oxide which shows transition from metal to insulation, i.e., semiconductors are:



D. All

**Answer: D**



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**416.8** : 8 coordination is noticed in:

A. MgO

B.  $Al_2O_3$

C. CsCl

D. All

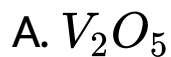
**Answer: C**



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417. The oxide that possesses electrical conductivity:



**Answer: B**



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**418.** In the unit-cell of NaCl lattice there are:

A.  $3\text{Na}^+$  ion

B.  $6\text{Na}^+$  ion

C.  $6\text{Cl}^-$  ion

D. 4NaCl units

**Answer: D**



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**419.** Which species is paramagnetic ?

A. NO

B.  $NO^-$

C.  $NO^+$

D. All are correct

**Answer: D**



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**420.** The substance which possesses zero resistance as 0 K:

A. Conductor

B. Super conductor

C. Insulator

D. Semiconductor

**Answer: B**



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**421.** Of the elements Sr,Zr,Mo,Cd and Sb, all of which are in V period, the paramagnetics are:

A. Se, Cd and Sb

B. Zr, Mo and Cd

C. Sr, Zr and Cd

D. Zr, Mo and Sb

**Answer: D**



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**422.** The cation-anion bond have the largest amount of covalent character for:

A. NaBr

B. SrS

C. CdS

D. BaO

**Answer: C**



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**423. Which is ferromagnetic?**

A. Ni

B. Co

C.  $CrO_3$

D. All

**Answer: D**

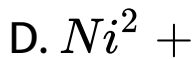


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**424.** Which one is diamagnetic?

A.  $ClO_2$

B.  $CU^{2+}$



**Answer: C**



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**425.** Maximum ferromagnetism is found in:

A. Fe

B. Ni

C. Co



D. None

**Answer: A**



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**426.** Crystals can be classified into ..... basic crystal habits?

A. 7

B. 4

C. 14

D. 3

**Answer: A**



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**427.** The maximum proportion of available volume that can be filled by hard spheres in diamond is:

A. 0.52

B. 0.34

C. 0.32

D. 0.68

**Answer: B**



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**428.** Lubricating properties of graphite are diminished in presence of:

A. High pressure

B. Low pressure

C. Vacuum

D. None

**Answer: C**



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**429.** Which do not form amalgam with Hg ?

A. Pt

B. Fe

C. Both (a) and (b)

D. None

**Answer: C**



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**430.** High thermal conductivity of metals is due to transfer of heat through:

A. Molecular collisions

B. Electronic collisions

C. Atomic collisions

D. All

**Answer: B**



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**431.** The metal surfaces are excellent reflectors because of absorption and re-emission of light by:

A. Protons in atom

B. Electrons in atom

C. Neutrons in atom

D. None

**Answer: B**



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**432.** An increase in the charge of the positive ions that occupy lattice positions brings in a/an..... in methallic bonding.

A. Increase

B. Decrease

C. Neither increase nor decrease

D. Either increase or decrease

**Answer: A**



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**433.** The hardness of metal increases with increase in number of ..... involved in metallic bonding.



A. Atoms

B. Molecules

C. Electrons

D. All

**Answer: C**



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**434.** Which possesses highest lattice energy?

A. LiBr

B. LiCl

C. LiI

D. LiF

**Answer: D**



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**435.** Each atom in bcc structure has .....

Nearest neighbours.

A. 8

B. 6

C. 4

D. 2

**Answer: A**



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**436.** The resistance of mercury becomes almost zero at :

A. 4 K

B. 10 K

C. 20 K

D. 25 k

**Answer: A**



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**437.** All the substances become diamagnetic at

:

A. 4 K

B. 10 k

C. 20 K

D. 25 K

**Answer: A**



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**438.** Extremely pure samples of Ge and Si are non-conductors ,but their conductivity increases suddenly on introducing ..... In their crystal lattice .

A. As

B. B

C. Both(a) and (b)

D. None

**Answer: C**



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**439.** Solids are characterised by their properties :

- A. Incompressibility
- B. Mechanical strength
- C. Crystalline nature
- D. All

**Answer: D**



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**440.** A solid having no definite shape is called

:

A. Amorphous solid

B. Crystalline solid

C. Anisotropic

D. None

**Answer: A**



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**441.** A solid having no definite geometrical shape with flat faces and sharp edges is :



A. Amorphous solid

B. Crystalline solid

C. Isotropic solid

D. None

**Answer: B**



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**442.** The crystals are bounded by plane faces (f), straight edges (e) and interfacial angle (c).

The relationship between these is :

A.  $f+c = e+2$

B.  $f+e = c+2$

C.  $c+e = f+2$

D. None

**Answer: A**



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**443.** A cubic crystal possesses :

A. 9 Plane of symmetry

B. 13 axis of symmetry

C. 1 centre of symmetry

D. All

**Answer: D**



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**444.** A cubic crystal possesses in all .....

Elements of symmetry .

A. 9

B. 13

C. 1

D. 23

**Answer: D**



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**445.** The statement that , .. It is possible to choose along the three coordinate axes unit distance  $a, b, c$  not necessarily of the same length , such that the ratio of there intercepts

of any plane in the crystal ,is given by in ma :  
nb:pc where m,n,p are either integral whole  
numbers including infinity or fraction of whole  
number, ..is known as :

A. Hauy's law of rationality of indices

B. The law of constancy of interfacial  
angles

C. The law of constancy of symmetry

D. None

**Answer: A**





**446.** The statement that , " All crystals of the same substance possess the same elements of symmetry " is known as :

- A. Hauy's law of rationality of indices
- B. The law of constancy of interfacial angles
- C. The law of constancy of symmetry
- D. None

**Answer: C**



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**447.** The statement that, .. That crystals of same substance can have different shapes depending upon the number and size of faces but the angle between the corresponding faces remains constant .. is known as :

A. Hauy's law of rationality of indices

B. The law of constancy of interfacial angles

C. The law of constancy of symmetry

D. None

**Answer: B**



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**448.** The ratio of cations to anion in a octahedral close packing is :



A. 0.414

B. 0.225

C. 0.02

D. None

**Answer: A**



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**449.** The ratio of cations to anion in a closed pack tetrahedral is :

A. 0.414

B. 0.225

C. 0.02

D. None

**Answer: B**



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**450.** If  $a$  is the length of unit cell .then which one is correct relationship :

A. For simple cubic lattice, Radius of metal

$$\text{atom} = a/2$$

B. For bcc lattice,

$$\text{Radius of metal atom} = \frac{\sqrt{3}a}{4}$$

C. For fcc lattice,

$$\text{Radius of metal atom} = \frac{a}{2\sqrt{2}}$$

D. All

**Answer: D**



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**451.** Amorphous solids:

A. Possess sharp melting points

B. Undergo clean cleavage when cut with  
knife

C. Do not undergo clean cleavage when cut  
with knife

D.

**Answer: C**



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452. Which of the following will show anisotropy?

A. Glass

B.  $BaCl_2$

C. Wood

D. Paper

**Answer: B**



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453. The unit cell with crystallographic dimensions  $a = b \neq c$ ,  $\alpha = \beta = \gamma = 90^\circ$  is

- A. Cubic
- B. Tetragonal
- C. Monoclinic
- D. Hexagonal

**Answer: B**



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**454.** The arrangement ABC, ABC ... is referred to as

- A. Octahedral close packing
- B. Hexagonal close packing
- C. Tetrahedral close packing
- D. Cubic close packing

**Answer: D**



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**455.** The interparticle forces in solid hydrogen are :

- A. Hydrogen bonds
- B. Covalent bonds
- C. Coordinate bonds
- D. van der Waals 'forces

**Answer: D**



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**456.** A solid X melts slightly above 273 K and is a poor conductor of heat and electricity. To which of the following categories does it belong :

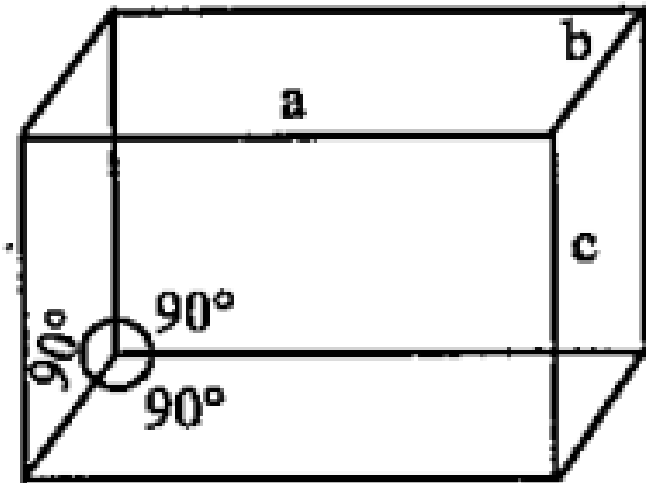
- A. Ionic solid
- B. Covalent solid
- C. metallic
- D. Molecular

**Answer: D**



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457. The unit cell with the structure below refers to ..... Crystal system.



- A. Cubic
- B. Orthorhombic
- C. Tetragonal

## D. Trigonal

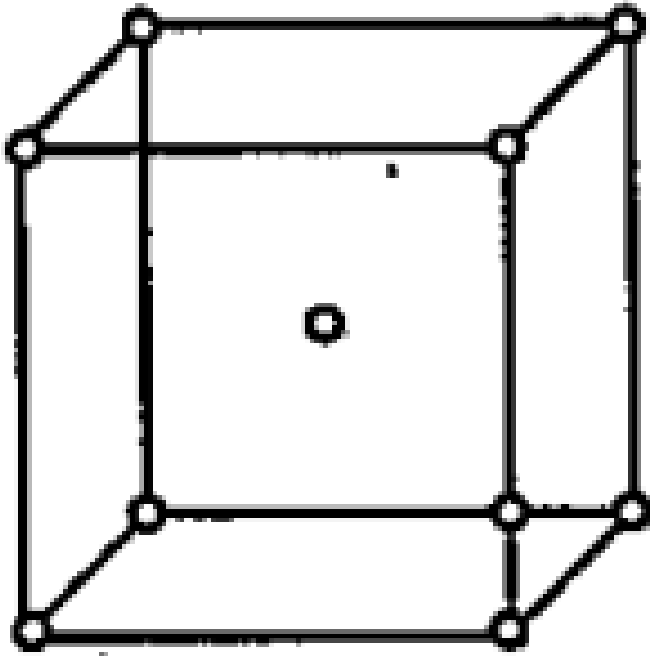
**Answer: B**



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**458.** A solid  $A^+ B^-$  has the  $B^-$  ions arranged as below. If the  $A^+$  ions occupy half of the tetrahedral sites in the structure. The formula

of solid is :



A.  $AB$

B.  $AB_2$

C.  $A_2B$

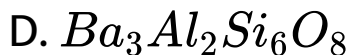
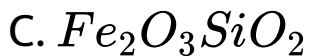
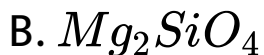
D.  $A_3B_4$

**Answer: C**



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**459.** The example of ortho silicate is :



**Answer: B**



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**460.** A binary solid ( $A^+ B^-$ ) has a zinc blende structure with  $B^-$  ions constituting the lattice and  $A^+$  ions occupying 25 % tetrahedral holes .The formula of solid is :

A. AB

B.  $A_2B$

C.  $AB_2$

D.  $AB_4$

**Answer: C**



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**461.** The radius of  $Na^+$  is 95 pm and  $Cl^-$  ion 181 pm. Find co-ordination number of  $Na^+$  ion.

A. 4

B. 6

C. 8

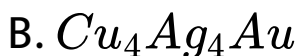
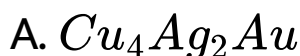
D. Unpredictable

**Answer: B**



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**462.** An alloy of copper, silver and gold is found to have copper constituting the ccp lattice . If silver atoms occupy the edge centre and gold is present at body centre, the alloy has a formula :





C.  $Cu_4Ag_3Au$

D.  $CuAgAu$

**Answer: C**



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**463.** Which is an example of ferroelectric compound ?

A. Quartz

B.  $PbCrO_4$

C. Barium titanate

D. None

**Answer: C**



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**464.** Which one is called pseudo solid ?

A.  $CaF_2$

B. Glass

C. NaCl

D. All

**Answer: B**



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**465.** The yellow colour of ZnO and conducting nature produced in heating is due to :

A. Meta excess defects due to interstitial cation

B. Extra positive ions present in an interstitial site

C. Trapped electrons

D. All

**Answer: D**



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**466.** The phenomenon in which crystals on subjecting to a pressure or mechanical stress produce electricity is called :

A. Pyroelectricity

B. Piezoelectric effect

C. Ferro electricity

D. Ferri electricity

**Answer: B**



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**467.** The phenomenon in which polar crystals on heating produce electricity is called :

A. Pyroelectricity

B. Piezoelectricity

C. Ferro electricity

D. Ferri electricity

**Answer: A**



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**468.** silicon doped with arsenic is an example of:

- A. p-type conductor
- B. n-type conductor
- C. n-p type conductor
- D. None

**Answer: B**



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**469.** The number of octahedral sites in a cubical close pack array of  $N$  spheres is :

A.  $N/2$

B.  $2N$

C.  $4N$

D. None

**Answer: D**



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**470.** In a close pack array of  $n$  spheres, the number of tetrahedral holes are :



A.  $4N$

B.  $N/2$

C.  $2N$

D.  $N$

**Answer: C**



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**471.** The coordination number of a metal crystallising in a hexagonal close-packed structure is :

A. 12

B. 4

C. 8

D. 6

**Answer: A**



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**472.** In a cubic close packing of spheres in three dimensions the coordination number of each sphere is:

A. 6

B. 9

C. 3

D. 12

**Answer: D**



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**473.** If the position of  $Na^+$  and  $Cl^-$  are interchanged in NaCl, the crystal lattice with respect to  $Na^+$  and  $Cl^-$  is :

A. Both fcc

B. Both bcc

C. fcc and bcc

D. bcc and fcc

**Answer: A**



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**474.** Which of the following statement is not correct ?

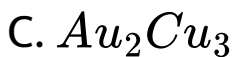
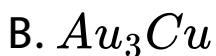
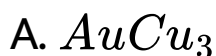
- A. The coordination number of each type of ion in CsCl crystal is 8.
- B. A metal that crystallises in bcc structure has a coordination no .of 12.
- C. A unit cell of an ionic crystal shares some of its ions with other unit cells .
- D. The length of the unit cell in NaCl is 552 pm ( $r_{Na^+} = 95 \pm$  ,  $r_{Cl^-} = 181 \pm$  ).

**Answer: B**



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**475.** A compound alloy of gold and Cu crystallises in a cubic lattice in which the gold atoms occupy the lattice points at the corners of a cube and the copper atoms occupy the centres of each of the cube faces. What is the empirical formula of this compound ?



D. AuCu

**Answer: A**



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**476.** The intermetallic compound LiAg has a cubic crystalline structure in which each Li atom has 8 nearest neighbour silver atoms and vice-versa .What is the type of unit cell ?

A. Body-centred cubic

B. Face-centred cubic

C. Simple cubic for either Li atoms alone or

Ag atoms alone

D. None of the above

**Answer: A**



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**477.** How many tetrahedral holes are occupied in diamond ?



A. 25 %

B. 50 %

C. 75 %

D. 100 %

**Answer: B**



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**478.** How many octahedral and tetrahedral holes are present per unit cell in a face-centred cubic arrangement of atoms?

A. 8,4

B. 1,2

C. 4,8

D. 2,1

**Answer: C**



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**479.** When arrangement of electrons leads to ferromagnetism?

A.  $\uparrow \uparrow \uparrow \uparrow$

B.  $\uparrow \uparrow \uparrow \uparrow$

C. Both (a) and (b)

D. None

**Answer: B**



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**480.** How many .nearest. and. next nearest. neighbours respectively potassium have in bcc lattice ?

A. 8,8

B. 8,6

C. 6,8

D. 8,2

**Answer: B**



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**481.** Ferrimagnetic is converted into ferromagnetic at :

A. 300 K

B. 400 K

C. 600 K

D. 850 K

**Answer: D**



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**482.** The PH of a solution is defined by the equation:

A.  $n\lambda = 2 \sin \theta$

B.  $n\lambda = 2d \sin \theta$

C.  $2d = n\lambda \sin \theta$

D.  $n\lambda = d \sin \theta$

**Answer: B**



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**483.** Fraction of the total volume occupied by atoms in a simple cube is :

A.  $\frac{\pi}{2}$

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

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

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

**Answer: D**



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**484.** The number of atoms (n) contained within a cubic cell is :

A. 1

B. 2

C. 3

D. 4

**Answer: A**



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**485.** The number of atoms ( $n$ ) contained within a cubic cell is :



A. 1

B. 2

C. 3

D. 4

**Answer: B**



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**486.** The number of atoms ( $n$ ) contained within a cubic cell is :

A. 1

B. 2

C. 3

D. 4

**Answer: D**



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**487.** A compound formed by elements A and B crystallizes in cubic structure where A atoms are at the corners of a cube and B atoms are

at the face centre. The formula of the compound is :



D. None of these

**Answer: A**



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**488.** A fcc element (atomic mass =60) has a cell edge of 400pm. Its density is :

A.  $6.23gcm^{-3}$

B.  $6.43gcm^{-3}$

C.  $6.53gcm^{-3}$

D.  $6.63gcm^{-3}$

**Answer: A**



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489. A compound  $\text{CuCl}$  has face centred cubic structure. Its density is  $3.4\text{gcm}^{-3}$ . The length of unit cell is :

A.  $5.783\text{\AA}$

B.  $6.783\text{\AA}$

C.  $7.783\text{\AA}$

D.  $8.783\text{\AA}$

**Answer: A**



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490. The density of KCl is  $1.9893\text{gcm}^{-3}$  and the length of a side unit is  $6.29082\text{\AA}$  as determined by X-Rays diffraction. The value of Avogadro's number calculated from these data is :

A.  $6.017 \times 10^{23}$

B.  $6.023 \times 10^{23}$

C.  $6.03 \times 10^{23}$

D.  $6.017 \times 10^{19}$

**Answer: A**



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**491.** A unit cell cube length for LiCl (just like NaCl structure) is  $5.14\text{\AA}$ . Assuming anion-anion contact, the ionic radius for chloride ion is :

A.  $1.815\text{\AA}$

B.  $2.8\text{\AA}$

C.  $3.8\text{\AA}$

D.  $4.815\text{\AA}$

**Answer: A**



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**492.** At room temperature, sodium crystallizes in a body centred cubic lattice with  $a = 4.24 \text{ \AA}$ . The theoretical density of sodium (At.wt. of Na=23) is:

A.  $1.002 \text{ gcm}^{-3}$

B.  $2.002 \text{ gcm}^{-3}$

C.  $3.002 \text{ gcm}^{-3}$



D. None of these

**Answer: A**



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**493.** Lithium borohydride crystallizes in an orthorhombic system with 4 molecule per unit cell .The unit cell dimensions are  $a = 6.8\overset{\circ}{\text{A}}$ ,  $b = 4.4\overset{\circ}{\text{A}}$  and  $c = 7.2\overset{\circ}{\text{A}}$ .If the molar mass is 21.76 then the density of crystals is :

A.  $0.6708 \text{gcm}^{-3}$

B.  $1.6708 \text{gcm}^{-3}$

C.  $2.6708 \text{gcm}^{-3}$

D. None

**Answer: A**



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**494.** Sodium metal crystalizes in a body centred cubic lattice with the cell edge

$a = 4.29 \text{Å}$ . The radius of sodium atom is :

A.  $1.8574\overset{\circ}{\text{A}}$

B.  $2.8574\overset{\circ}{\text{A}}$

C.  $3.8574\overset{\circ}{\text{A}}$

D. None

**Answer: A**



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**495.** A solid compound  $X^+ Y^-$  has NaCl structure.

If radius of  $X^+$  is 100 pm . What is the radius

of  $Y^-$  ion:

A. 120 pm

B. 136.6 to 241.6 pm

C. 136.6 pm

D. 241.6 pm

**Answer: B**



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**496.** A solid has a bcc structure. If the distance of closest approach between the two atoms is  $1.73\overset{\circ}{\text{A}}$ . The edge length of the cell is :

A. 200 pm

B.

C. 142.2 pm

D.

**Answer: A**



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**497.** A binary solid ( $A^+ B^-$ ) has a rock salt structure. If the edge length is 400 pm and

radius of cation is 75 pm the radius of anion is

:

A. 100 pm

B. 125 pm

C. 250 pm

D. 325 pm

**Answer: B**



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**498.** The ionic radii of  $Rb^+$  and  $I^-$  are  $1.46\overset{\circ}{\text{A}}$  and  $2.16\overset{\circ}{\text{A}}$ . The most probable type of structure exhibited by it is :

A. CsCl type

B. NaCl type

C. ZnS type

D.  $CaF_2$  type

**Answer: B**



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**499.** The density of KBr is  $2.75 \text{ gm cm}^{-3}$   
length of the unit cell is 654 pm . K=39,Br=80,  
then what is true about the predicted nature  
of the solid:

- A. Solid has face centred cubic system with  
coordination number=6
- B. Solid has simple cubic system with  
coordination number =4
- C. Solid has face centred cubic system with  
coordination number =1



D. None

**Answer: A**



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**500.** In a face centred cubic arrangement of A and B atoms whose A atoms are at the corner of the unit cell and B atoms at the face centres: One of the A atom is missing from one corner in unit cell . The simplest formula of compound is :

A.  $A_7B_3$

B.  $Ab_3$

C.  $A_7B_{24}$

D.  $\frac{A_7}{8}B_3$

**Answer: C**



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**501.** The radius of  $Ag^+$  ion is 126 pm while that of  $I^-$  ion is 216 pm . The coordination number of Ag in AgI is :

A. 2

B. 4

C. 6

D. 8

**Answer: C**



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**502.** CsBr has bcc structure with edge length

4.3. The shortest inter ionic distance in

between  $Cs^+$  and  $Br^-$  is :

A. 3.72

B. 1.86

C. 7.44

D. 4.3

**Answer: A**



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**503.** Edge length of a cube is 400 pm. Its body diagonal would be :

A. 600 pm

B. 566 pm

C. 693 pm

D. 500 pm

**Answer: C**



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**504.** IN a sodium chloride crystal, each chloride ion is surrounded by :

A. 6 sodium ions

B. 6 chloride ions

C. 8 sodium ions

D. 4 sodium ions

**Answer: A**



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**505.** The structure of NaCl crystal is :

A. Body centred cubic lattice

B. Face centred cubic lattice

C. Octahedral

D. Square planar

**Answer: B**



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**506.** The number of atoms per unit cell in a simple cube, face centred cube and body centred cube are respectively:

A. 2

B. 3

C. 4

D. 14

**Answer: C**



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**507.** A crystal may have one or more planes of symmetry as well as one or more axes of symmetry but it has :



A. Two centres of symmetry

B. No centre of symmetry

C. One centre of symmetry

D. Four centres of symmetry

**Answer: C**



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**508.** The total number of symmetry in a cubic crystal is :

A. 9

B. 23

C. 10

D. None

**Answer: B**



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**509.** The structure of CsCl crystal is:

A. Body centred cubic lattice

B. Face centred cubic lattice

C. Octahedral

D. None

**Answer: A**



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**510.** Close packing is maximum in the crystal which is -

A. Simple cube

B. Face centred cube

C. Body centred cube

D. Primitive cube

**Answer: B**



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**511.** The number of atoms per unit cell in a simple cube, face centred cube and body centred cube are respectively:

A. 1,4,2

B. 1,2,4

C. 8,14,9

D. 8,4,2

**Answer: A**



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**512.** The coordination number of a body centred atom is:

A. 4

B. 6

C. 8

D. 12

**Answer: C**



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**513.** Bragg's equation has no solution if:

A.  $n\lambda = 2d$

B.  $n\lambda > 2d$

C.  $n\lambda < 2d$

D. All

**Answer: B**



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**514.** In a body centred cubic arrangement the ion A occupies the centre while the ions B occupy the corners of a cube the formula of the crystal is:

A.  $AB$

B.  $A_2B$

C.  $AB_2$

D.  $AB_3$

**Answer: A**



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**515.** A crystalline solid

A. Isotropic



B. Sharp melting point

C. Definite geometry

D. High intermolecular forces

**Answer: A**



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**516.** The number of Bravais lattices in a cubic crystal is:

A. 3

B. 1

C. 4

D. 14

**Answer: A**



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**517.** The volume occupied by an atom in a simple cubic unit cell is:

A.  $a^3$

B.  $\frac{4\pi a^3}{3}$

C.  $\frac{\pi a^3}{6}$

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

**Answer: C**



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**518.** The atomic radius of a face centred cubic cell is:

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

B.  $\frac{\sqrt{2} \cdot a}{4}$

C.  $\frac{\sqrt{3} \cdot a}{4}$

D.  $\frac{a}{4}$

**Answer: B**



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