



An Eye on Talent

## Olympiad Aptitude Test Chemistry Class XII

Which of the following is NOT a property of solids?

- (A) Solids are always crystalline in nature.  
(B) Solids have high density and low compressibility.  
(C) The diffusion of solids is very slow.  
(D) Solids have definite volume.
- A crystalline solid \_\_\_\_\_.

(A) changes abruptly from solid to liquid when heated  
(B) has no definite melting point  
(C) undergoes deformation of its geometry easily  
(D) has an irregular 3-dimensional arrangements
- Mostly crystals show good cleavage because their atoms, ions or molecules are \_\_\_\_\_.

(A) weakly bonded together  
(B) strongly bonded together  
(C) spherically symmetrical  
(D) arranged in planes
- How many space lattices are obtainable from the different crystal systems?

(A) 7                      (B) 14  
(C) 32                     (D) 230
- The number of unit cells in 58.5 g of NaCl is nearly \_\_\_\_\_.

(A)  $6 \times 10^{20}$               (B)  $3 \times 10^{22}$   
(C)  $1.5 \times 10^{23}$             (D)  $0.5 \times 10^{24}$
- Which of the following represents ferromagnetism?

(A)  $\uparrow\uparrow\uparrow\uparrow$     (B)  $\uparrow\downarrow\uparrow\downarrow$   
(C)  $\uparrow\uparrow\downarrow\downarrow$     (D)  $\uparrow\uparrow\uparrow\downarrow$
- Frenkel defect is caused due to \_\_\_\_\_.

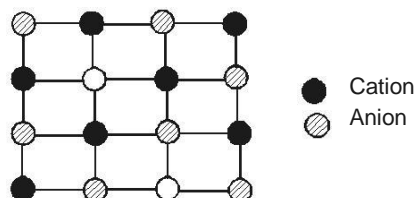
(A) an ion missing from the normal lattice site creating a vacancy  
(B) an extra positive ion occupying an interstitial position in the lattice  
(C) an extra negative ion occupying an interstitial position in the lattice  
(D) the shift of a positive ion from its normal lattice site to an interstitial site

8. For the various types of interactions, the CORRECT order of increasing strength is:
- covalent < hydrogen bonding  
<van der Waal's < dipole-dipole
  - van der Waal's < hydrogen bonding  
<dipole-dipole < covalent
  - van der Waal's < dipole-dipole  
<hydrogen bonding < covalent
  - dipole-dipole < van der Waal's  
<hydrogen bonding < covalent

9. Pyrex glass is obtained by fusing together \_\_\_\_\_.

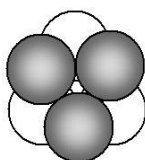
- 60 to 80%  $\text{Al}_2\text{O}_3$ , 10 to 25%  $\text{SiO}_2$  and remaining amount of  $\text{B}_2\text{O}_3$
- 60 to 80%  $\text{B}_2\text{O}_3$ , 10 to 25%  $\text{Al}_2\text{O}_3$  and remaining amount of  $\text{SiO}_2$
- 60 to 80%  $\text{SiO}_2$ , 10 to 25%  $\text{B}_2\text{O}_3$  and remaining amount of  $\text{Al}_2\text{O}_3$
- 60 to 80%  $\text{SiO}_2$ , 10 to 25%  $\text{Al}_2\text{O}_3$  and remaining amount of  $\text{B}_2\text{O}_3$

10. The given structure represents \_\_\_\_\_.



- Schottky defect
  - Frenkel defect
  - Metal excess defect
  - Metal deficiency defect
11. Which of the following are the CORRECT axial distances and axial angles for rhombohedral system?
- $a = b = c, \alpha = \beta = \gamma \neq 90^\circ$
  - $a = b \neq c, \alpha = \beta = \gamma = 90^\circ$
  - $a \neq b \neq c, \alpha = \beta = \gamma = 90^\circ$
  - $a \neq b \neq c, \alpha \neq \beta \neq \gamma \neq 90^\circ$
12. The empty space between the shared balls and hollow balls as shown in the diagram is called \_\_\_\_\_.

- hexagonal void
- octahedral void
- tetrahedral void
- triangular void

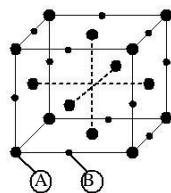


13. In fullerene, carbon atoms are \_\_\_\_\_ hybridized.

- $sp$
- $sp^2$
- $sp^3$
- $sp^3d$

14. For a solid with the structure as shown in the figure, the coordination number of the point B is \_\_\_\_\_.

- (A) 3  
(B) 4  
(C) 5  
(D) 6



15. Which of the following pair of compounds is NOT isomorphous?

- (A) NaF and MgO  
(B)  $K_2SO_4$  and  $K_2SeO_4$   
(C)  $NaNO_3$  and  $CaCO_3$   
(D) NaCl and KCl

16. The ionic radii of  $Rb^+$  and  $I^-$  are 1.46 and 2.16

Å. The most probable type of structure exhibited by it is \_\_\_\_\_ type.

- (A) CsCl                      (B) NaCl  
(C) ZnS                      (D)  $CaF_2$

The solid NaCl is a bad conductor of electricity since \_\_\_\_\_.

17. (A) in solid NaCl, there are no ions  
(B) solid NaCl is covalent  
(C) in solid NaCl, there is no velocity of ions  
(D) in solid NaCl, there are no electrons

18. Ferrous oxide has a cubic structure and each edge of the unit cell is 5.0 Å. Assuming density of the oxide as  $4.09 \text{ g cm}^{-3}$ , then the number of  $Fe^{2+}$  and  $O^{2-}$  ions present in each unit cell will be \_\_\_\_\_.

- (A) four  $Fe^{2+}$  and four  $O^{2-}$   
(B) two  $Fe^{2+}$  and four  $O^{2-}$   
(C) four  $Fe^{2+}$  and two  $O^{2-}$   
(D) three  $Fe^{2+}$  and three  $O^{2-}$

19. Which of the following statement is NOT CORRECT?

- (A) The number of carbon atoms in a unit cell of diamond is 4.  
(B) The number of Bravais lattices in which a crystal can be categorised is 14.  
(C) The fraction of the total volume occupied by the atoms in a primitive cell is 0.48.  
(D) Molecular solids are generally volatile.

20. Which of the following statements is CORRECT for  $CsBr_3$ ?

- (A) It is a covalent compound.  
(B) It contains  $Cs^{3+}$  and  $Br^-$  ions.  
(C) It contains  $Cs^+$  and  $Br_3^-$  ions.  
(D) It contains  $Cs^+$ ,  $Br^-$  and lattice  $Br_2$  molecule