PRERNA EDUCATION
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Chapter 1 The Solid State

Assignment 4

Class 12

PRERNA EDUCATION

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth | **SUBJECT : CHEMISTRY**
DATE : | **DPP No. : 4**

Topic :- THE SOLID STATE

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

   a) V_2O_3 b) VO_2 c) Ti_2O_3 d) All of these

2. 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

3. Crystals can be classified into ……. Basic crystal habits.

   a) 7 b) 4 c) 14 d) 3

4. The unit cell with crystallographic dimensions $a = b \neq c;\ \alpha = \beta = \gamma = 90^0$ is :

   a) Cubic b) Tetragonal c) Monoclinic d) Hexagonal

5. The number of octahedral void(s) per atom present in a cubic close-packed structure is :

   a) 2 b) 4 c) 1 d) 3

6. The hardness of metals increases with increase in number of ……involved in metallic bonding.

   a) Atoms b) Molecules c) Electrons d) All of these

7. The substance which possesses zero resistance as 0 K :

a) Conductor b) Super conductor c) Insulator d) Semiconductor

8. Sodium metal crystallises at room temperature in a body centred cubic lattice with a cell edge $a = 4.29$ Å. The radius of sodium atom is
   a) 1.40 b) 2.65 c) 1.85 d) 2.15

9. The oxide which shows metallic conduction:
   a) ReO_3 b) VO c) CrO_2 d) All of these

10. The number of hexagonal faces that are present in a truncated octahedron is
    a) 2 b) 4 c) 6 d) 8

11. Which of the following statement is true?
    a) Some complex metal oxides behave as superconductor
    b) Zinc oxide can act as superconductor
    c) An impurity of tetravalent germanium in trivalent gallium creates electron deficiency
    d) A Frenkel defect is formed when an ion is displaced from its lattice site to an interstitial site

12. Schottky defect defines imperfection in the lattice structure of a :
    a) Solid b) Gas c) Liquid d) Plasma

13. When electrons are trapped into the crystal in anion vacancy, the defect is known as :
    a) Schottky defect b) Frenkel defect c) Stoichiometric defect d) F-centres

14. Which of the following has highest value of energy gap?
    a) Aluminum b) Silver c) Germanium d) Diamond

15. If 'a' stands for the edge length of the cubic systems : simple cubic, body-centred cubic and face-centered, then the ratio of radii of the spheres in these systems will be respectively,

a) $\frac{1}{2}a : \sqrt{3}\,a : \frac{1}{\sqrt{2}}\,a$ b) $\frac{1}{2}a : \frac{\sqrt{3}}{2}\,a : \frac{\sqrt{2}}{2}\,a$ c) $\frac{1}{2}a : \sqrt{3}a : \sqrt{2}a$ d) $\frac{1}{2}a : \frac{\sqrt{3}}{4}\,a : \frac{1}{2\sqrt{2}}\,a$

16. 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

17. Percentage of free space in cubic close packed structure and in body centred packed structure are respectively

a) 30% and 26% b) 26% and 32% c) 32% and 48% d) 48% and 26%

18. Lithium borohydride crystallizes in an orthorhombic system with 4 molecule per unit cell. The unit cell dimensions are $a = 6.8$ Å, $b = 4.4$ Å and $c = 7.2$ Å. If the molar mass is 21.76, then the density of crystals is :

a) $0.6708\ \text{g cm}^{-3}$ b) $1.6708\ \text{g cm}^{-3}$ c) $2.6708\ \text{g cm}^{-3}$ d) None of these

19. Total volume of atoms present in a face centred cubic unit cell of a metal is (r=atomic radius)

a) $\frac{20}{3}\pi r^3$ b) $\frac{24}{3}\pi r^3$ c) $\frac{12}{3}\pi r^3$ d) $\frac{16}{3}\pi r^3$

20. Which has no rotation of symmetry?

a) Hexagonal b) Orthorhombic c) Cubic d) Triclinic