HOLIDAY HOMEWORK CHEMISTRY

CLASS-XII

Very short answer questions

Q1. Which point defect in crystals does not alter the density of the relevant solid?

Q2. How do metallic and ionic substances differ in conducting electricity?

Q3. What is the number of atoms in a unit cell of a face-centred cubic crystal?

Q4. What type of interactions hold the molecules together in a polar molecular solid?

Q5. What type of semiconductor is obtained when silicon is doped with arsenic?

Q6. Write a distinguishing feature of metallic solids.

Q7. What is the formula of a compound in which the element Y forms ccp lattice and atoms of X occupy 1/3rd of tetrahedral voids?

Q8. A metallic element crystallises into a lattice having a ABC ABC … pattern and packing of spheres leaves out voids in the lattice. What type of structure is formed by this arrangement?

Q9. Which ionic compound shows both Frenkel and Schottky defects?

Q10. What type of stoichiometric defect is shown by NaCl?

Assertion –Reason type questions

In the following questions, a statement of Assertion (A) is followed by a corresponding statement of Reason (R). Out of the following statements choose the correct option.

(a) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) If assertion is true but reason is false.

(d) If the assertion and reason both are false.

Q11. Assertion : Diamond is a precious stone.
Reason : Carbon atoms are tetrahedrally arranged in diamond.

Q12. Assertion : In crystal lattice, the size of the cation is larger in a tetrahedral hole than in an octahedral hole.
Reason : The cations occupy more space than anions in crystal packing.

Q13. Assertion : Crystalline solids have short range order.
Reason : Amorphous solids have long range order.

Q14. Assertion : In any ionic solid (MX) with Schottky defects, the number of positive and negative ions are same.
Reason : Equal number of cation and anion vacancies are present.

Q15. Assertion : In close packing of spheres, a tetrahedral void is surrounded by four spheres whereas an octahedral void is surrounded by six spheres.

Reason : A tetrahedral void has a tetrahedral shape whereas an octahedral void has an octahedral shape.

LONG ANSWER QUESTIONS

Q16. The density of lead is 11.35 g cm^{-3} and the metal crystallizes with fee unit cell. Estimate the radius of lead atom.
(At. Mass of lead = 207 g mol^{-1} and $N_A = 6.02 \times 10^{23}$ mol^{-1})

Q17. Copper crystallises with face centred cubic unit cell. If the radius of copper atom is 127.8 pm, calculate the density of copper metal.
(Atomic mass of Cu = 63.55 u and Avogadro's number $N_A = 6.02 \times 102^{23}$ mol^{-1})

Q18. (a) What are intrinsic semi-conductors? Give an example.
(b) What is the distance between Na^+ and Cl^- ions in NaCl crystal if its density is 2.165 g cm^{-3}? [Atomic Mass of Na = 23u, Cl = 35.5u; Avogadro's number = 6.023×10^{23}]

Q19. What type of semiconductor is obtained when silicon is doped with boron?
(b) What type of magnetism is shown in the following alignment of magnetic moments?

(c) What type of point defect is produced when AgCl is doped with $CdCl_2$?

Q20. If NaCl is doped with 10^{-3} mol % of $SrCl_2$, what is the concentration of cation vacancies?