

UNIT TEST-6
(SOLID STATE)

CLASS : XII
SUB : CHEMISTRY

TIME : 3.00HRS
MARKS : 70

PART-I

I. Choose and write the correct answer :

15X1=15

1. Which of the following is an example of hydrogen bonded molecular solid
 a) $C_6H_{12}O_6$ b) Solid CO_2 c) naphthalene d) anthracene
2. The fraction of total volume occupied by simple cubic is
 a) $(\frac{\pi}{4})$ b) $(\frac{\pi}{6})$ c) $(\frac{\pi}{3})$ d) $(\frac{\pi}{8})$
3. Percentage of void in simple cubic lattice is
 a) 51.26% b) 48.26% c) 47.69% d) 53.16%
4. The percentage of packing efficiency in CsCl crystal lattice is
 a) 68% b) 74% c) 52.31% d) 54.26%
5. The crystal with metal deficiency defect is
 a) NaCl b) FeO c) ZnO d) KCl
6. Graphite and diamond are
 a) Covalent and molecular crystals b) ionic and covalent crystals
 c) both covalent crystals d) both molecular crystals
7. Solid CO_2 is an example of
 a) Covalent solid b) metallic solid c) molecular solid d) ionic solid
8. The vacant space in bcc lattice unit cell is
 a) 48% b) 23% c) 32% d) 26%
9. The yellow colour in NaCl crystal is due to
 a) excitation of electrons in F centers b) reflection of light from Cl^- ion on the surface
 c) refraction of light from Na^+ ion d) all of the above
10. The ratio of radius of cation and anion $(\frac{r_{C^+}}{r_{A^-}})$ is 0.548 then the structure is
 a) cube b) octahedral c) tetrahedral d) trigonal planar
11. The crystal structure of CsCl is _____
 a) Simple cubic b) Face centred cubic c) Tetragonal d) Body centred cubic
12. The $(\frac{r_{C^+}}{r_{A^-}})$ ratio of NaCl is
 a) 0.155-0.225 b) 0.225-0.415 c) 0.414-0.732 d) 0.732-1.0
13. Total no. of atoms in bcc unit cell
 a) 1 b) 2 c) 3 d) 4
14. The coordination number of the sphere in simple cubic arrangement is ____
 a) 6 b) 12 c) 3 d) 4
15. Which defect is cation and anion differ in size ____
 a) Schottky defect b) frenkel defect c) both a and b d) none of these

PART-II**II. Answer any six questions (q.no.24 is compulsory)****6 x 2 =12**

16. Define unit cell.
17. What are point defects?
18. Atoms X and Y form bcc crystalline structure. Atom X is present at the corners of the cube and Y is at the centre of the cube. What is the formula of the compound?
19. What is packing efficiency ?
20. What are primitive and non primitive unit cell
21. Define covalent solids
22. If the Radius ratio of the compound is between 0.155 to 0.225 find out the coordination number and structure of the compound
23. What are crystal defects classified ?
24. If the number of close packed sphere is 8 calculate the number of octahedral voids and tetrahedral voids generated

PART-III**III. Answer any six questions (q.no.33 is compulsory)****6 x 3 =18**

25. Write a note on Frenkel defect.
26. Calculate the packing efficiency of SC crystal lattice ?
27. Distinguish between tetrahedral and octahedral voids ?
28. Write the Bragg's equation ? explain its terms
29. Why ionic crystals are hard and brittle?
30. What is meant by the term "coordination number"? What is the coordination number of atoms in a bcc structure?
31. Distinguish between isotropy and anisotropy in solids
32. Classify the following into Covalent molecular ionic and metallic solids
 - i) Diamond
 - ii) brass
 - iii) NaCl
 - iv) Naphthalene
 - v) glucose
 - vi) P₄
33. substantiate with suitable reason zinc oxide is colourless at room temperature and on heating it turns to yellow colour

PART-IV**IV. Answer all the questions .****5x5=25**

34. a) i) Sketch and calculate the number of atoms in SC , BCC and FCC unit cell.
ii) Write short note on Schottky defect
(OR)
b) Write the short note on the metal deficiency defect and metal excess defect with example
35. a) i) What are the difference between amorphous and crystalline solids?
ii) Calculate the number of atom in Fcc unit cell ?
(OR)
b) i) Derive an expression for density of a crystal
ii) Write any three general characteristics. Ionic solid ?

36. a) i) Calculate the packing efficiency of BCC unit cell ?
ii) Write the short note on the impurity defect in crystal

(OR)

- b) Classify molecular crystal with an example for each type.

37. a) explain AAAA and ABABA and ABABC type of three dimensional packing with the help of neat diagram ?

(OR)

- b) Distinguish between hexagonal close packing and cubic close packing

38. a) Explain briefly seven types of unit cell.

(OR)

- b) i) Explain f centres with a neat diagram
ii) Imperfections in solid play an important role in various is process justify
