Name : _____ Date : _____ Time : Start [ ] End [ ] Marks : 100

NEET | Class XII

CHEMISTRY

DPP | C | 059

Chapter 1 : Solid State

Instructions :

- DPP contains 25 topicwise questions :
- Each question has four options out of which only one option is correct.
- Each question carries 4 marks.
- Mark the correct answer in the OMR Sheet given at the end of the DPP.
- For every incorrect answer deduct 1 mark.

Topic : Classification of solids, crystal lattices, unit cells, closed packed structure, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell

1. A particular solid is very hard and has high melting point. In solid sate it is a non-conductor and its molten or aqueous solution is a conductor of electricity. The solid is of which type?
(a) Metallic (b) Molecular (c) Network (d) Ionic

2. Which among the following will show anisotropy?
(a) Glass (b) Barium chloride
(c) Wood (d) Paper

3. The lattice parameters of a given crystal are a = 5.62 Å, b = 7.41 Å and c = 9.45 Å. The three coordinate axes are mutually perpendicular to each other. The crystal is
(a) tetragonal (b) orthorhombic
(c) monoclinic (d) trigonal.

4. Which of the following type of cubic lattice has maximum number of atoms per unit cell?
(a) Simple cubic (b) Body centred cubic
(c) Face centred cubic (d) All have same

5. In *bcc* structure, contribution of corner and central atom respectively are
(a) $\frac{1}{8}, 1$ (b) $\frac{1}{4}, \frac{1}{8}$ (c) $\frac{1}{8}, \frac{1}{2}$ (d) $1, \frac{1}{2}$

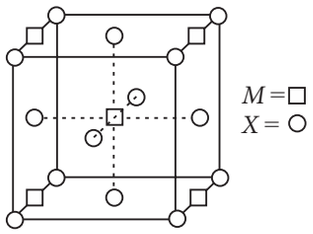
6. In NaCl, the chloride ions occupy the space in a fashion of
(a) *fcc* (b) *bcc*
(c) both (a) and (b) (d) none of these.

7. The coordination number of face centred cubic (*fcc*) structure is
(a) 12 (b) 10 (c) 8 (d) 6

8. Which of the following arrangements correctly represents hexagonal and cubic close packed structure respectively?
(a) *ABCABC* ..... and *ABAB* .....
(b) *ABAB* ..... and *ABCABC* .....
(c) Both have *ABAB* ..... arrangement.
(d) Both have *ABCABC* ..... arrangement.

9. When molten zinc is cooled to solid state, it assumes *hcp* structure. Then the number of nearest neighbours of zinc atom will be
(a) 4 (b) 6 (c) 3 (d) 12

10. A compound M_pX_q has cubic close packing (*ccp*) arrangement of X. Its unit cell structure shown below. The empirical formula of the compound is



(a) MX (b) MX_2
(c) M_2X (d) M_5X_{14}

11. If in diamond, there is a unit cell of carbon atoms as *fcc* and if carbon atom is sp^3 hybridised, then what fractions of voids are occupied by carbon atom?
(a) 25% tetrahedral (b) 50% tetrahedral
(c) 25% octahedral (d) 50% octahedral

12. A solid has a structure in which W atoms are located at the corners of a cubic lattice, O atoms at the centre of the edges and Na atom at centre of the cube. Then formula for the compound is
(a) $NaWO_2$ (b) $NaWO_3$
(c) Na_2WO_3 (d) $NaWO_4$

13. A compound is formed by elements A and B. This crystallises in the cubic structure where A atoms are at the corners of the cube

and *B* atoms are at the body centres. The simplest formula of the compound is
(a) A_8B_4 (b) AB_6 (c) AB (d) A_6B

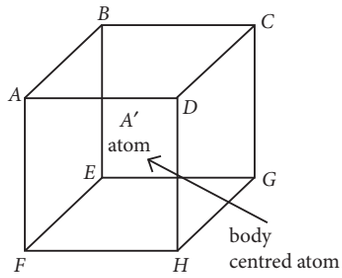
14. A compound of copper and gold crystallises in a cubic lattice in which the copper atoms occupy the centres of each of the cube faces and the gold atoms occupy the lattice point. The formula of compound is
(a) Au_3Cu (b) $AuCu_3$
(c) Au_2Cu_3 (d) Au_3Cu_2

15. If the anions (*A*) form hexagonal closest packing and cations (*C*) occupy only 2/3 octahedral voids in it, then the general formula of the compound is
(a) *CA* (b) CA_2 (c) C_2A_3 (d) C_3A_2

16. In spinel structure, O^{2-} ions are cubic closed packed, whereas $1/8^{th}$ of the tetrahedral holes are occupied by A^{2+} cations and 1/2 of the octahedral holes are occupied by cations B^{3+}. The general formula of this compound is
(a) A_2BO_4 (b) AB_2O_4 (c) A_2B_4O (d) A_4B_2O

17. In *fcc* arrangement of *A* and *B* atoms, where *A* atoms are at the corners of the unit cell, *B* atoms at the face centres, two atoms are missing from two corners in each unit cell, then the simplest formula of the compound is
(a) A_7B_6 (b) A_6B_7 (c) A_7B_{24} (d) AB_4

18. In the cubic lattice given below, the three distances between the atoms *AB*, *AC*, and *AG* are respectively



(a) $a, \sqrt{2}a, \sqrt{3}a$ (b) $a, \frac{\sqrt{3}a}{2}, \sqrt{2}a$
(c) $\frac{\sqrt{3}a}{2}, \sqrt{2}a, a$ (d) $a, \frac{a}{\sqrt{2}}, \frac{\sqrt{3}a}{2}$

19. Copper crystallises in a face-centred cubic lattice with a unit cell length of 361 pm. What is the radius of copper atom in pm?
(a) 157 (b) 181 (c) 108 (d) 128

20. The metal *M* crystallises in a body centred lattice with cell edge 400 pm. the atomic radius of *M* is
(a) 200 pm (b) 100 pm (c) 173 pm (d) 141 pm

21. Lithium metal crystallises in a body-centred cubic crystal. If the length of the side of the unit cell of lithium is 351 pm, the atomic radius of lithium will be
(a) 151.98 pm (b) 75.55 pm
(c) 300.05 pm (d) 240.80 pm

22. CsBr has *bcc* structure with edge length 4.3 Å. The shortest inter ionic distance in between Cs^+ and Br^- is
(a) 3.72 Å (b) 1.86 Å (c) 7.44 Å (d) 4.3 Å

23. A metal has *bcc* structure and the edge length of its unit cell is 3.04 Å. The volume of the unit cell (in cm^3) will be
(a) 1.6×10^{-21} (b) 2.81×10^{-23}
(c) 6.02×10^{-23} (d) 6.6×10^{-24}

24. Which of the following statements is not correct?
(a) The number of carbon atoms in a unit cell of diamond is 8.
(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.

25. The vacant space in *bcc* unit cell is
(a) 32% (b) 10% (c) 23% (d) 46%

OMR SHEET

Use HB pencil only and darken each circle completely.
Mark only one choice for each question as indicated.

Correct marking ● ⓑ ⓒ ⓓ
Wrong marking ⊗ ✓ ◑ ⊙

1. ⓐ ⓑ ⓒ ⓓ	4. ⓐ ⓑ ⓒ ⓓ	7. ⓐ ⓑ ⓒ ⓓ	10. ⓐ ⓑ ⓒ ⓓ	13. ⓐ ⓑ ⓒ ⓓ	16. ⓐ ⓑ ⓒ ⓓ	19. ⓐ ⓑ ⓒ ⓓ	22. ⓐ ⓑ ⓒ ⓓ	25. ⓐ ⓑ ⓒ ⓓ
2. ⓐ ⓑ ⓒ ⓓ	5. ⓐ ⓑ ⓒ ⓓ	8. ⓐ ⓑ ⓒ ⓓ	11. ⓐ ⓑ ⓒ ⓓ	14. ⓐ ⓑ ⓒ ⓓ	17. ⓐ ⓑ ⓒ ⓓ	20. ⓐ ⓑ ⓒ ⓓ	23. ⓐ ⓑ ⓒ ⓓ	
3. ⓐ ⓑ ⓒ ⓓ	6. ⓐ ⓑ ⓒ ⓓ	9. ⓐ ⓑ ⓒ ⓓ	12. ⓐ ⓑ ⓒ ⓓ	15. ⓐ ⓑ ⓒ ⓓ	18. ⓐ ⓑ ⓒ ⓓ	21. ⓐ ⓑ ⓒ ⓓ	24. ⓐ ⓑ ⓒ ⓓ	

RESULT C | 059 - CHEMISTRY

Total Questions	25	Total Marks	100
Attempted		Correct	
Incorrect		Net Score	

Net Score = (Correct × 4) – (Incorrect × 1) = ...
Percentage Score = ...

Check your learning! If your score is

> 90%	EXCELLENT WORK !
90-75%	GOOD WORK !
74-60%	SATISFACTORY !
< 60%	NOT SATISFACTORY!