

Chapter 12 : Solids

Sl. No.	Question	Obj/ Spec./ Diff. Level
1.	How many lattice points are present per unit cell of sodium chloride? 27 lattice point	U Identify Average
2.	What are crystalline solids? Definite geometrical shape	K Define Easy
3.	Give an example for crystalline solids. Any suitable example (NaCl, KCl, etc)	U Cite example Easy
4.	What are the constituents of covalent crystals? Non metal atoms or atoms	U Identify Average
5.	Define space lattice. Correct definition	K Define Easy
6.	Define unit cell. Correct definition. Unit cell is the smallest structural repeating unit of a crystalline solid.	K Define Easy
7.	Define co-ordination number for a crystalline solid.	K Define Easy

- Total number of the nearest neighbouring particles situated around a particle.
8. Give an example for molecular crystal.
- U
Cite
example
Average
- Solid iodine, dry ice or any suitable example.
9. Define ionic radius.
- K
Define
Easy
- Distance between the nucleus of an ion and the point upto which its nuclear charge has the influence on its electron cloud.
10. Define radius ratio of an ionic crystal.
- K
Define
Easy
- Ratio of the radius of the cation to the radius of the anion present in the crystal.
11. The co-ordination number of crystal is 8. What is its crystal structure?
- U
Identify
Average
- BCC
12. Identify face centered cubic lattice among the following CsCl, NaCl, ZnS.
- U
Identify
Average
- NaCl
13. Radius ratio of a crystal is between 0.414 – 0.732. What is the co-ordination number of each ion?
- K
Recognize
Average
- 6
14. The radii of cation and anion of the crystal are 94 pm and 146 pm respectively, predict the structure of the crystal.
- A
Predict
Difficult
- Octahedral

15. Each sodium ion in a crystal of sodium chloride is surrounded by how many Cl^- ions?
6
U
Identify
Easy
16. How do crystalline solids differ from amorphous solids regarding their melting points?
Crystalline solids have sharp melting points
U
Compare
Average
17. Mention the nature of forces operating in ionic crystals.
Electrostatic force of attraction
K
Mention
Average
18. What is the radius ratio range for ionic crystals having co-ordination number 4?
0.225 to 0.414
A
Predict
19. Mention the type of cubic lattice in CsCl.
BCC
K
Mention
Easy
20. Draw the unit cell of a BCC lattice.
S
Drawing and
labeling
Average
21. Define radius ratio. What is its significance?
Radius ratio = $\frac{4r_+}{r_-}$ (1 mark)
Significance : Co-ordination number (1 mark)
K
Define
Average

22. Mention any two differences between crystalline and amorphous solids.
- U
Discriminate
Average**

Any two differences (each correct difference – 1 mark)

23. Calculate the number of particles present in a unit cell of face centered cubic lattice.
- U
Identify
Average**

$$\begin{aligned} \text{No. of particles in a fcc} &= \frac{1}{8} \times 8 \text{ (at corner)} + \frac{1}{2} \times 6 \text{ (at face center)} \text{ (1 mark)} \\ &= 1 + 3 \quad \left. \vphantom{\frac{1}{8} \times 8} \right\} \text{ 1 mark} \\ &= 4 \end{aligned}$$

24. Calculate the number of particles present in a unit cell of body centered cubic lattice.
- A
Interpret
Average**

$$\begin{aligned} \text{No. of particles in a bcc} &= \frac{1}{8} \times 8 \text{ (at corners)} + 1 \text{ (at centre)} \\ &= 1 + 1 \quad \text{(1 mark)} \\ &= 2 \quad \text{(1 mark)} \end{aligned}$$

25. Classify these into ionic, metallic, covalent and molecular crystal: Dry ice, diamond, KCl, K
- A
Classify
Average**

Ionic crystal = KCl (½ mark)
 Covalent crystal = diamond (1/2 mark)
 Metallic crystal = K (½)
 Molecular crystal = dry ice (½ mark)

26. With respect to the unit cell of NaCl, mention
- K
Recognize
Difficult**
- i) crystal system
 - ii) geometry
 - iii) type of crystal lattice
- i) Cubic (1 mark)
 - ii) Octahedral (1 mark)
 - iii) F.C.C. (1 mark)