**Karan Arora**  **R.L. Institute M :9416974837**

**Max Time : 1 hr** **SOLID STATE Max Marks : 25**

**CODE : A**

1. Which of the following does not represent radius of atom correctly ?

(i) simple cubic cell : Radius of the atom = (ii) Face centred cubic cell : Radius =

(iii) Body centred cubic cell : Radius = a

|  |  |  |  |
| --- | --- | --- | --- |
| a) (i) | b) (iii) | c) (ii) | d) (i) & (ii) |

1. Solid X is a very hard solid which is electrical insulator in solid as well as in molten state and has extremely high melting point. What type of solid is it ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Ionic solid | b) Covalent solid | c) Metallic solid | d) Molecular solid |

1. A compound is formed by two elements Y and Z. The element Z forms ccp and atom Y occupy 1/3rd of tetrahedral voids. The formula of the compound is

|  |  |  |  |
| --- | --- | --- | --- |
| a) Y2Z3 | b) YZ | c) YZ3 | d) Y2Z |

1. Ionic solids conduct electricity in molten state but not in solid state because

a) in molten state free ions are furnished which are not free to move in solid state

b) in solid state ionic solids are hard and brittle and become soft in molten state

c) all solids conduct electricity in molten state

d) in solids state ions are convert to atoms which are insulators.

1. Match the column I with column II and mark the appropriate choice.

Column I Column II

(Radius ratio) (Coordination number)

|  |  |  |
| --- | --- | --- |
| (A) 0.155 – 0.225 | | (i) 4 |
| (B) 0.225 – 0.414 | | (ii) 8 |
| (C) 0.414 – 0.732 | | (iii) 3 |
| (D) 0.732 – 1.0 | | (iv) 6 |
| a) (A) – (i) , (B) – (ii) , (C) – (iv) , (D) – (iii) | | b) (A) – (ii) , (B) – (iv) , (C) – (i) , (D) – (iii) | | |
| c) (A) – (iv) , (B) – (iii) , (C) – (i) , (D) – (ii) | | d) (A) – (iii) , (B) – (i) , (C) – (iv) , (D) – (ii) | | |

1. In face centred cubic unit cell , edge length is

|  |  |  |  |
| --- | --- | --- | --- |
| a) r | b) r | c) 2r | d) r |

1. How many lithium atoms are present in a unit cell with edge length 3.5 Å and density 0.53 g cm-3 ? (Atomic mass of Li = 6.94)

|  |  |  |  |
| --- | --- | --- | --- |
| a) 2 | b) 1 | c) 4 | d) 6 |

1. Which among the following will show anisotropy ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Glass | b) NaBr | c) Plastic | d) Rubber |

1. What type of crystal defect is shown in the figure given below ?

Na+ Cl – Na+ Cl – Na+

Cl – ⃝ Cl – Na+ Cl –

Na+ Cl – Na+ ⃝ Na+

Cl – Na+ ⃝ Cl – ⃝

Na+ Cl – Na+ Cl – Na+

|  |  |  |  |
| --- | --- | --- | --- |
| a) Frenkel defect | b) Schottky defect | c) Interstitial defect | d) Cation excess defect |

1. The unit cell of aluminium is a cube with an edge length of 405 pm. The density of aluminium is 2.70 g cm-3 . What is the structure of unit cell of aluminium ?

|  |  |
| --- | --- |
| a) Body-centred cubic cell | b) Face-centred cubic cell |
| c) End-centred cubic cell | d) Simple cubic cell |

1. If three element X , Y & Z crystallizes in a ccp lattice with X atoms at the corners, Y atoms at the cube centre and Z atoms at the edges , the formula of compound will be

|  |  |  |  |
| --- | --- | --- | --- |
| a) XYZ | b) XYZ2 | c) XYZ3 | d) X2Y2Z |

1. NaCl type crystal (with coordination no. 6 : 6) can be converted into CsCl type crystal (with coordination no. 8 : 8) by applying

|  |  |
| --- | --- |
| a) High temperature | b) High pressure |
| c) High temperature and high pressure | d) Low temperature and low pressure |

1. The density of a metal which crystallizes in bcc lattice with unit cell edge length 300 pm and molar mass 50 g mol–1 will be

|  |  |  |  |
| --- | --- | --- | --- |
| a) 10 g cm-3 | b) 14.2 g cm-3 | c) 6.15 g cm-3 | d) 9.32 g cm-3 |

1. A crystalline structure has radius ratio ( / ) in the range of 0.225 – 0.414. The coordination number and arrangement of anions around the cations is

|  |  |  |  |
| --- | --- | --- | --- |
| a) 3, plane triangular | b) 6, octahedral | c) 4, tetrahedral | d) 8, cubic |

1. If the distance between Na+ & Cl – in NaCl crystal is 265pm, the edge length of the unit cell will be

|  |  |  |  |
| --- | --- | --- | --- |
| a) 265 pm | b) 795 pm | c) 132.5 pm | d) 530 pm |

1. A metal crystallizes into a lattice containing a sequence of layers as AB AB AB …….. . What percentage of void are left in the lattice ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 72 % | b) 48 % | c) 26 % | d) 32 % |

1. If the radius of an octahedral void is r and radius of atoms in close packing is R, the relation between r & R is

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| a) r = 0.414 R | b) R = 0.414 r | c) r = 2 R | d) r = R |

1. Copper crystallizes in fcc with a unit cell length of 361 pm. What is the radius of copper atom ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 157 pm | b) 181 pm | c) 127 pm | d) 108 pm |

1. The fraction of total volume occupied by the atoms present in a simple cube is

|  |  |  |  |
| --- | --- | --- | --- |
| a) | b) | c) | d) |

1. What type of stoichiometry defect is shown by ZnS ?

|  |  |
| --- | --- |
| a) Schottky defect | b) Frenkel defect |
| c) Both Frenkel and Schottky defect | d) Non-stoichiometric defect |

1. Formula of nickel oxide with metal deficiency defect in its crystal is Ni0.98 O. The crystal contains Ni2+ and Ni3+ ions. The fraction of nickel existing as Ni2+ ions in the crystal is

|  |  |  |  |
| --- | --- | --- | --- |
| a) 0.94 | b) 0.04 | c) 0.50 | d) 0.3 |

1. The edge length of sodium chloride unit cell is 564 pm. If the size of Cl – ion is 181 pm. The size of Na+ ion will be

|  |  |  |  |
| --- | --- | --- | --- |
| a) 101 pm | b) 181 pm | c) 410 pm | d) 202 pm |

1. Zinc oxide loses electrons on heating according to the reaction ,

ZnO Zn2+ + O2 + 2 e – , It becomes yellow on heating because

a) Zn2+ ions and electrons move to interstitial sites and F-centres are created

b) Oxygen and electrons move out of the crystal and ions become yellow

c) Zn2+ again combine with oxygen to give yellow oxide

d) Zn2+ are replaced by oxygen.

1. In ccp arrangement the pattern of successive layers can be designated as

|  |  |  |  |
| --- | --- | --- | --- |
| a) AB AB AB | b) ABC ABC ABC | c) AB ABC AB | d) ABA ABA ABA |

1. In a Schottky defect,

a) an ion moves to interstitial position between the lattice points

b) electrons are trapped in a lattice site

c) some lattice sites are vacant

d) some extra cations are present in interstitial spaces.

**Karan Arora**  **R.L. Institute M :9416974837**

**Max Time : 1 hr** **SOLID STATE Max Marks : 25**

**CODE : B**

1. Solid X is a very hard solid which is electrical insulator in solid as well as in molten state and has extremely high melting point. What type of solid is it ?

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| c) (A) – (iv) , (B) – (iii) , (C) – (i) , (D) – (ii) | | d) (A) – (iii) , (B) – (i) , (C) – (iv) , (D) – (ii) | | |

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d) Zn2+ are replaced by oxygen.

**Answers**

**SOLID STATE [CLASS = 12th ]**

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