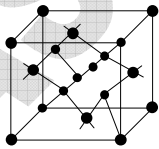
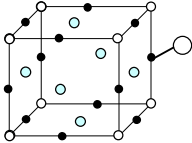
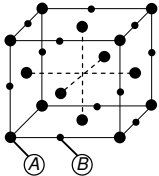
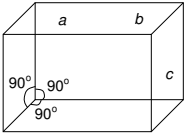
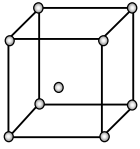
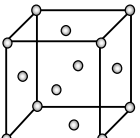


Solid state Assignment

- Which among the following will show anisotropy
(a) Glass (b) Barium chloride (c) Wood (d) Paper
- The interparticle forces in solid hydrogen are
(a) Hydrogen bonds (b) Covalent bonds (c) Co-ordinate bonds (d) Vander Waal's forces
- The existence of a substance in more than one solid modifications is known as or any compound having more than two crystal structures is called
(a) Polymorphism (b) Isomorphism (c) Allotropy (d) Enantiomorphism
- In graphite, carbon atoms are joined together due to
(a) Ionic bonding (b) Vander Waal's forces (c) Metallic bonding (d) Covalent bonding
- Mostly crystals show good cleavage because their atoms, ions or molecules are
(a) Weakly bonded together (b) Strongly bonded together (c) Spherically symmetrical (d) Arranged in planes
- A solid melts slightly above 273 K and is a poor conductor of heat and electricity. To which of the following categories does it belong.
(a) Ionic solid (b) Covalent solid (c) Metallic (d) Molecular
- The Miller indices of a plane having intercepts $2a, 2b, \infty$ are
(a) 110 (b) 220 (c) 100 (d) 010
- The following structure drawn is of
(a) Fluorite
(b) Caesium chloride
(c) Wurtzite
(d) Zinc blende

- For the structure given below the site marked as S is a
(a) Tetrahedral void
(b) Cubic void
(c) Octahedral void
(d) None of these

- For a solid with the following structure, the co-ordination number of the point B is
(a) 3
(b) 4
(c) 5
(d) 6

- The unit cell with the structure below refer tocrystal system
(a) Cubic
(b) Orthorhombic
(c) Tetragonal
(d) Trigonal

- A solid A^+B^- has the B^- ions arranged as below. If the A^+ ions occupy half of the octahedral sites in the structure. The formula of solid is
(a) AB
(b) AB_2
(c) A_2B
(d) A_3B_4

- For the structure of solid given below if the lattice points represent A^+ ions and the B^- ions occupy all the tetrahedral voids then coordination number of A is
(a) 2
(b) 4
(c) 6
(d) 8

- In A^+B^- ionic compound, radii of A^+ and B^- ions are 180 pm and 187 pm respectively. The crystal structure of this compound will be
(a) NaCl type (b) CsCl type (c) ZnS type (d) Similar to diamond

GRAVITY CLASSES

15. For an ionic crystal of the type AB , the value of (limiting) radius ratio is 0.40. The value suggests that the crystal structure should be
- (a) Octahedral (b) Tetrahedral (c) Square planar (d) Plane triangle
16. If the value of ionic radius ratio $\left(\frac{r_c}{r_a}\right)$ is 0.52 in an ionic compound, the geometrical arrangement of ions in crystal is
- (a) Tetrahedral (b) Planar (c) Octahedral (d) Pyramidal
17. **Assertion (A)** : In crystal lattice, the size of the cation is larger in a tetrahedral hole than in an octahedral hole
Reason (R) : The cations occupy more space than anions in crystal packing
- (a) Both A and R are true statements and R is the correct explanation of A .
(b) Both A and R are true statements and R is not the correct explanation of A .
(c) A is true but R is a false statement.
(d) Both A and R are false statements.
18. If the radius ratio is in the range of 0.414 – 0.732, then the coordination number will be
- (a) 2 (b) 4 (c) 6 (d) 8
19. The maximum radius of sphere that can be fitted in the tetrahedral hole of cubical closed packing of sphere of radius r is.
- (a) $0.732 r$ (b) $0.414 r$ (c) $0.225 r$ (d) $0.155 r$
20. In $NaCl$ lattice the radius ratio is $\frac{r_{Na^+}}{r_{Cl^-}} =$
- (a) 0.225 (b) 0.115 (c) 0.5414 (d) 0.471
21. An element occurring in the bcc structure has 12.08×10^{23} unit cells. The total number of atoms of the element in these cells will be
- (a) 24.16×10^{23} (b) 36.18×10^{23} (c) 6.04×10^{23} (d) 12.08×10^{23}
22. For an ionic crystal of the general formula AX and coordination number 6, the value of radius ratio will be
- (a) Greater than 0.73 (b) In between 0.73 and 0.41 (c) In between 0.41 and 0.22 (d) Less than 0.22
23. The number of unit cells in 58.5 g of $NaCl$ is nearly
- (a) 6×10^{20} (b) 3×10^{22} (c) 1.5×10^{23} (d) 0.5×10^{24}
24. If the radius ratio is in the range of 0.225–0.414, then the coordination number will be
- (a) 2 (b) 4 (c) 6 (d) 8
25. An alloy of Cu , Ag and Au is found to have copper constituting the ccp lattice. If silver atoms occupy the edge centre and gold is present at body centre, the alloy has a formula
- (a) Cu_4Ag_2Au (b) Cu_4Ag_4Au (c) Cu_4Ag_3Au (d) $CuAgAu$
26. For cubic coordination the value of radius ratio is
- (a) 0.732–1.000 (b) 0.225–0.414 (c) 0.000–0.225 (d) 0.414 – 0.732
27. The edge length of the unit cell of $NaCl$ crystal lattice is 552 pm. If ionic radius of sodium ion is 95 pm, what is the ionic radius of chloride ion
- (a) 190 pm (b) 368 pm (c) 181 pm (d) 276 pm
28. The maximum radius of sphere that can be fitted in the octahedral hole of cubical closed packing of sphere of radius r is
- (a) $0.732 r$ (b) $0.414 r$ (c) $0.225 r$ (d) $0.155 r$
29. The number of atoms in 100 gm of an fcc crystal with density $d = 10 \text{ g/cm}^3$ and cell edge equal to 100 pm, is equal to
- (a) 4×10^{25} (b) 3×10^{25} (c) 2×10^{25} (d) 1×10^{25}
30. Potassium fluoride has $NaCl$ type structure. What is the distance between K^+ and F^- ions if cell edge is $a \text{ cm}$
- (a) $2 a \text{ cm}$ (b) $a / 2 \text{ cm}$ (c) $4 a \text{ cm}$ (d) $a / 4 \text{ cm}$
31. For some crystals, the radius ratio for cation and anion is 0.525. Its coordination number will be
- (a) 2 (b) 4 (c) 6 (d) 8
32. The pycnometric density of sodium chloride crystal is $2.165 \times 10^3 \text{ kg m}^{-3}$ while its X – rays density is $2.178 \times 10^3 \text{ kg m}^{-3}$. The fraction of unoccupied sites in sodium chloride crystal is
- (a) 5.96×10^{-3} (b) 5.96 (c) 5.96×10^{-2} (d) 5.96×10^{-1}
33. How many space lattices are obtainable from the different crystal systems
- (a) 7 (b) 14 (c) 32 (d) 230
34. Sodium metal crystallizes as a body centred cubic lattice with the cell edge 4.29Å. What is the radius of sodium atom.
- (a) $1.857 \times 10^{-8} \text{ cm}$ (b) $2.371 \times 10^{-7} \text{ cm}$ (c) $3.817 \times 10^{-8} \text{ cm}$ (d) $9.312 \times 10^{-7} \text{ cm}$

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35. For tetrahedral coordination number, the radius ratio $\frac{r_c^+}{r_a^-}$ is
 (a) 0.732 – 1.000 (b) 0.414 – 0.732 (c) 0.225 – 0.414 (d) 0.155 – 0.225
36. An element (atomic mass = 100 g/mol) having *bcc* structure has unit cell edge 400 pm. Then density of the element is
 (a) 10.376 g/cm³ (b) 5.188 g/cm³ (c) 7.289 g/cm³ (d) 2.144 g/cm³
37. The structure of *TlCl* is similar to *CsCl*. What would be the radius ratio in *TlCl*
 (a) 0.155 – 0.225 (b) 0.225 – 0.414 (c) 0.414 – 0.732 (d) 0.732 – 1.000
38. *Na* and *Mg* crystallize in *bcc* and *fcc* type crystals respectively, then the number of atoms of *Na* and *Mg* present in the unit cell of their respective crystals is
 (a) 4 and 12 (b) 9 and 14 (c) 14 and 9 (d) 2 and 4
39. Potassium has a *bcc* structure with nearest neighbour distance 4.52 Å. Its atomic weight is 39. Its density (in kg m⁻³) will be
 (a) 454 (b) 804 (c) 852 (d) 908
40. The intermetallic compound *LiAg* crystallizes in cubic lattice in which both lithium and silver have coordination number of eight. The crystal class is
 (a) Simple cube (b) Body-centred cube (c) Face-centred cube (d) None of these
41. To get a *n*-type semiconductor, the impurity to be added to silicon should have which of the following number of valence electrons
 (a) 1 (b) 2 (c) 3 (d) 5
42. Silicon doped with arsenic is an example of which type of semiconductor
 (a) *p*-type (b) *n*-type (c) *n,p*-type (d) Intrinsic type
43. A semiconductor of *Ge* can be made *p*-type by adding
 (a) Trivalent impurity (b) Tetravalent impurity (c) Pentavalent impurity (d) Divalent impurity
44. Superconductors are derived from compounds of
 (a) *p*-Block elements (b) Lanthanides (c) Actinides (d) Transition elements
45. The three dimensional lattice of zeolites consists of
 (a) $[Si_2O_7]^{6-}$ (b) $[SiO_3]_n^{2n-}$ (c) $[Si_2O_5]_n^{2n-}$ (d) Only *SiO*₂
 (e) $[AlSi_3O_8]^-$
46. The three states of matter are solid, liquid and gas. Which of the following statement is/are true about them
 (a) Gases and liquids have viscosity as a common property
 (b) The molecules in all the three states possess random translational motion
 (c) Gases cannot be converted into solids without passing through the liquid phase
 (d) Solids and liquids have vapour pressure as a common property
47. In a crystal, the atoms are located at the position of
 (a) Maximum P.E. (b) Minimum P.E. (c) Zero P.E. (d) Infinite P.E.
48. In a close packed array of *N* spheres, the number of tetrahedral holes are
 (a) *N* / 2 (b) 4*N* (c) 2*N* (d) *N*
49. The correct statement in the following is
 (a) The ionic crystal of *AgBr* has Schottky defect
 (b) The unit cell having crystal parameters, $a = b \neq c, \alpha = \beta = 90^\circ, \gamma = 120^\circ$ is hexagonal
 (c) In ionic compounds having Frenkel defect the ratio $\frac{\gamma_+}{\gamma_-}$ is high
 (d) The coordination number of *Na*⁺ ion in *NaCl* is 4
50. If *NaCl* is doped with 10⁻³ mol% *SrCl*₂, then the concentration of cation vacancies will be
 (a) 1 × 10⁻³ mol% (b) 2 × 10⁻³ mol% (c) 3 × 10⁻³ mol% (d) 4 × 10⁻³ mol%