QB365 Question Bank Software Study Materials

Solid State 50 Important 1 Marks Questions With Answers (Book Back and Creative)

12th Standard
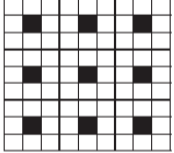
Chemistry

Total Marks : 50

Multiple Choice Question

50 x 1 = 50

1) Graphite and diamond are _____.

   (a) Covalent and molecular crystals   (b) ionic and covalent crystals   **(c) both covalent crystals**

   (d) both molecular crystals

2) An ionic compound $A_x B_y$ crystallizes in fcc type crystal structure with B ions at the centre of each face and A ion occupying corners of the cube the correct formula of A_xB_y is _____.

   (a) AB   **(b) AB_3**   (c) A_3B (d) A_8B_6

3) The ratio of close packed atoms to tetrahedral hole in cubic packing is _____.

   (a) 1:1   **(b) 1:2**   (c) 2:1   (d) 1:4

4) Solid CO_2 is an example of _____.

   (a) Covalent solid   (b) metallic solid   **(c) molecular solid**   (d) ionic solid

5) In calcium fluoride, having the flurite structure the coordination number of Ca^{2+} ion and F^- Ion are _____.

   (a) 4 and 2   (b) 6 and 6   **(c) 8 and 4**   (d) 4 and 8

6) The number of unit cells in 8 gm of an element X (atomic mass 40) which crystallizes in bcc pattern is (N_A is the Avogadro number)_____.

   (a) 6.023 x 10^{23} **(b) 6.023 x 10^{22}**   (c) 60.23 x 10^{23} (d) $\left(\frac{6.023 \times 10^{23}}{8 \times 40} \right)$

7) In a solid atom M occupies ccp lattice and $\left(\frac{1}{3} \right)$ of tetrahedral voids are occupied by atom N. Find the formula of solid formed by M and N _____.

   (a) MN   (b) M_3N (c) MN_3 **(d) M_3N_2**

8) The ionic radii of A^+ and B^- are 0.98 x 10^{-10} m and 1.81 x 10^{-10} m. the coordination number of each ion in AB is _____.

   (a) 8   (b) 2   **(c) 6**   (d) 4

9) CsCl has bcc arrangement, its unit cell edge length is 400pm, its inter atomic distance is _____.

   (a) 400pm   (b) 800pm   (c) $\sqrt{3} \times 100 pm$ **(d) $\left(\frac{\sqrt{3}}{2} \right) \times 400 pm$**

10) A solid compound XY has NaCl structure if the radius of the cation is 100pm, the radius of the anion will be _____.

   (a) $\left(\frac{100}{0.414} \right)$ (b) $\left(\frac{0.732}{100} \right)$ (c) 100 x 0.414   (d) $\left(\frac{0.414}{100} \right)$

11) The vacant space in bcc lattice unit cell is _____.

   (a) 48%   (b) 23%   **(c) 32%**   (d) 26%

12) The radius of an atom is 300pm, if it crystallizes in a face centered cubic lattice, the length of the edge of the unit cell is _____.

   (a) 488.5pm   **(b) 848.5pm**   (c) 884.5pm   (d) 484.5pm

13) The fraction of total volume occupied by the atoms in a simple cubic is _____.

   (a) $\left(\frac{\pi}{4\sqrt{2}} \right)$ **(b) $\left(\frac{\pi}{6} \right)$**   (c) $\left(\frac{\pi}{4} \right)$ (d) $\left(\frac{\pi}{3\sqrt{2}} \right)$

14) 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

15) If 'a' stands for the edge length of the cubic system sc, bcc, and fcc. Then the ratio of radii of spheres in these systems will be respectively _____.

(a) $\left(\frac{1}{2}a; \frac{\sqrt{3}}{2}a; \frac{\sqrt{2}}{2}a\right)$ (b) $\left(\sqrt{1a} : \sqrt{3a} : \sqrt{2a}\right)$ **(c)** $\left(\frac{1}{2}a : \frac{\sqrt{3}}{4}a : \frac{1}{2\sqrt{2}}a\right)$ (d) $\frac{1}{2}a : \sqrt{3}a : \frac{1}{\sqrt{2}}a$

16) If 'a' is the length of the side of the cube, the distance between the body centered atom and one corner atom in the cube will be_____.

(a) $\left(\frac{2}{\sqrt{3}}\right)a$ (b) $\left(\frac{4}{\sqrt{3}}\right)a$ (c) $\left(\frac{\sqrt{3}}{4}\right)a$ **(d)** $\left(\frac{\sqrt{3}}{2}\right)a$

17) Potassium has a bcc structure with nearest neighbor distance 4.52 $\overset{o}{A}$. Its atomic weight is 39. its density will be_____.

(a) 915 kg m^{-3}   (b) 2142 kg m^{-3} (c) 452 kg m^{-3} (d) 390 kg m^{-3}

18) Schottky defect in a crystal is observed when _____.

(a) unequal number of anions and anions are missing from the lattice

(b) Equal number of cations and anions are missing from the lattice

(c) an ion leaves its normal site and occupies an interstitial site   (d) no ion is missing from its lattice

19) The cation leaves its normal position in the crystal and moves to some interstitial position, the defect in the crystal is known as _____.

(a) Schottky defect   (b) F center   **(c) Frenkel defect**   (d) non-stoichiometric defect

20) The crystal with a metal deficiency defect is _____.

(a) NaCl   **(b) FeO**   (c) ZnO   (d) KCl

21) A two dimensional solid pattern formed by two different atoms X and Y is shown below. The black and white squares represent atoms X and Y respectively. The simplest formula for the compound based on the unit cell from the pattern is _____.

(a) XY$_8$ (b) X$_4$Y$_9$ (c) XY$_2$ (d) XY$_4$

22) In which of the following arrangements, octahedral voids are formed?

(a) fcc   (b) bcc   (c) simple cubic   **(d) hcp**

23) Amorphous solids have _____.

(a) Orderly arrangement of atoms   (b) Long range of melting point   (c) Anisotropy   **(d) both (a) and (c)**

24) Which of the following features is false regarding the structure of CsCI?

(a) It has bee arrangements   (b) Co-ordination number for each ion is 8   **(c) Number of atoms in a unit cell is 4**

(d) The radius ratio (r_+/r_-) is 0.93

25) Schottky defects contains _____.

(a) Cation vacancies only   (b) Cation vacancies and interstitial cations   **(c) Equal number of cation and anion vacancies**

(d) Anion vacancies and interstitial anions

26) In a body centred cubic unit cell, a metal atom at the centre of the cell is surrounded by how many other metal atoms?

(a) 12   (b) 4   (c) 6   **(d) 8**

27) In the Bragg's equation for diffraction of X-rays, 'n' represents _____.

(a) The number of moles   (b) Avogadro number   (c) A quantum number   **(d) Order of reflection**

28) The diffraction of crystal of Ba with X-ray of wavelength $2.29 \overset{\circ}{A}$ gives a first order reflection at 27°8. What is the distance between the diffracted patterns?

(a) $5.02 \overset{\circ}{A}$ **(b) $0.398 \overset{\circ}{A}$**   (c) $2.51 \overset{\circ}{A}$ (d) $10.04 \overset{\circ}{A}$

29) Crystalline solids are also called as _____.

(a) supercooled liquids   **(b) true solids**   (c) pseudo solids   (d) all the above

30) The defect arising due to an ion occupying interstitial position is called _____.

(a) Schottky defect   (b) Metal excess defect   **(c) Frenkel defect**   (d) Metal deficiency defect

31) Examples of hydrogen bonded molecular solids _____.

(a) H_2O (b) glucose   (c) urea   **(d) all the above**

32) The number of chloride ions present per unit of CsCI are _____.

(a) 6   (b) 8   **(c) 1**   (d) 4

33) Graphite is a good conductor of electricity due to the presence of_____.

(a) Lone pair of electrons   **(b) Free valence electrons**   (c) Cations   (d) Anions

34) The C-C and Si-C inter atomic distances are 154 pm and 188 pm. The atomic radius of Si is_____.

(a) 77Pm   (b) 94Pm   (c) 114Pm   **(d) 111Pm**

35) The coordination number of a metal crystallising in a hexagonal close packed structure is _____.

(a) 6   (b) 4   (c) 8   **(d) 12**

36) Iodine crystals are _____.

(a) covalent   (b) ionic   (c) metallic   **(d) molecular**

37) In edge centred lattice, an atom in the edge is shared by_____.

(a) 4 unit cell   **(b) 12 unit cell**   (c) 2 unit cell   (d) 8 unit cell

38) An example of covalent crystal is _____.

(a) CsCl   (b) NaCl   (c) ice   **(d) diamond**

39) Coordination number of tetrahedral and octahedral voids respectively are_____.

(a) 2,4   (b) 4,2   **(c) 4,6**   (d) 6,4

40) The coordination number of each sphere in body centred cubic packing is _____.

(a) 2   (b) 4   (c) 6   **(d) 8**

41) The correct order of packing efficiency in different types of unit cells is_____.

(a) fcc > bcc > sc   (b) sc < fcc < bcc   (c) fcc < bcc > sc   (d) bcc < fcc < sc

42) The arrangement of crystallographic axes and angles respectively in hexagonal crystal systems is _____.

(a) $a \neq b \neq c; \alpha = \beta = \gamma = 90°$ (b) $a = b \neq c; \alpha = \beta = \gamma = 90°$ **(c) $a = b \neq c; \alpha = \beta = 90°, \gamma = 120°$**

(d) $a = b = c; a \neq \beta \neq \gamma = 90°$

43) Which one is an example tor ionic crystal?

(a) Solid CO_2 (b) Graphite   **(c) Potassium chloride**   (d) Urea

44) Number of atoms in a bcc unit cells _____.

(a) 1   **(b) 2**   (c) 3   (d) 4

45) The coordination number of an octahedral void is _____.

(a) 4   **(b) 6**   (c) 2   (d) 8

46) How many types of primitive unit cells are there?

(a) 7   (b) 8   (c) 14   (d) 2

47) Certain crystals produce electric signals on the application of pressure. This phenomenon is _____.

(a) Pyro electricity   (b) Ferro electricity   **(c) Piezo electricity**   (d) Ferric electricity

48) ln diamond crystal, each carbon atom is linked with this number of carbon atoms _____.

(a) 1   **(b) 4**   (c) 8   (d) 2

49) Which one of the following units can be used to build the structure of diamond?

(a) Tetrahedral   (b) Octahedral   (c) Hexagonal   (d) cubic

50) CsBr crystal has bcc structure. It has an edge length of 4.3 A^o. The shortest interionic distance between Cs$^+$ and Br$^-$ is_____.

(a) 1.86 A^o   (b) 3.72 A^o (c) 2.86 A^o (d) 4.72 A^o