



CHEMISTRY

AAKASH INSTITUTE ENGLISH

MOCK TEST 15

Example

1. Which of the following is non-polar molecular solid?

A. SiC

B. Naphthlene

C. HCl

D. AlN

Answer: B



Watch Video Solution

2. Solids for which physical properties like electric resistance or refractive index show

different values when measured along different directions are called

- A. Pseudo solids
- B. Isotropic solids
- C. Polymorphic solids
- D. Anisotropic solids

Answer: D



Watch Video Solution

3. Which of the following given list has molecular solids only?

A. Carborundum, dry ice, diamond, solid

H_2 , benzene

B. Naphthalene, Na_2SO_4 copper,

corundum, CI_4

C. Corundum, camphor, silicon carbide, ice,

solid CS_2

D. Solid H_2 , camphor, dry ice, *solid* CS_2 ,

naphthalene

Answer: D



Watch Video Solution

4. Match the crystal system/unit cells mentioned in Column I with their characteristic features mentioned in Column II.

Column I		Column II	
(A)	simple cubic and face-centred cubic	(p)	have these cell parameters $a = b = c$ and $\alpha = \beta = \gamma$
(B)	cubic and rhombohedral	(q)	are two crystal systems
(C)	cubic and tetragonal	(r)	have only two crystallographic angles of 90°
(D)	hexagonal and monoclinic	(s)	belong to same crystal system

A. a(iii), b(iv), c(ii), d(i)

B. a(ii) b(iv), c(i), d(i)

C. a(i), b(v), c(iv), d(ii)

D. a(v), b(iii), c(ii), d(i)

Answer: B



Watch Video Solution

5. If all the three interaxial angles defining the unit cell are equal in magnitude, the crystal cannot belong to

(I) Orthorhombic system

(II) Monoclinic system

(III) Hexagonal system

(IV) Tetragonal system

A. II, III

B. I, IV

C. III, IV

D. I, II

Answer: A



Watch Video Solution

6. Which of the following sets of axial angles and axial lengths represent maximum number in Bravais lattices?

A. $\alpha = \beta = \gamma = 90^\circ$ and $a = b \neq c$

B. $\alpha = \beta = \gamma = 90^\circ$ and $a \neq b \neq c$

C. $\alpha = \beta = \gamma \neq 90^\circ$ and $a = b = c$

D. $\alpha = \beta = \gamma = 90^\circ$ and $a = b = c$

Answer: B



Watch Video Solution

7. Which of the following given crystal system is the most symmetrical and the most unsymmetrical system respectively?

A. Cubic, Hexagonal

B. Orthorhombic, Monoclinic

C. Cubic, Tridinic

D. Rhombohedral, Tetragonal

Answer: C



Watch Video Solution

8. Sodium crystallizes in a face centred cubic lattice. The approximate number of unit cells in 5.0 g of sodium is (Atomic mass of sodium = 23 mu)

A. $32.7 \times 10_{22}$

B. $3.27 \times 10_{(22)}$

C. $6.54 \times 10_{(22)}$

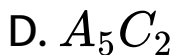
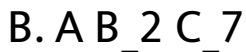
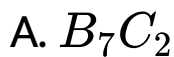
D. $65.4 \times 10_{22}$

Answer: B



Watch Video Solution

9. Three atoms A, B and C crystallize in a cubic solid lattice where A atoms are present at the body centre, B atoms are present at the edge centre as well as at the corners of the cube and C atoms are present at the face centres of the cube. Now if all the atoms are removed from the two 4-fold axis and the one 2-fold axis passing through the cube, then the formula of the compound is



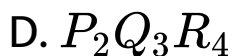
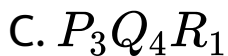
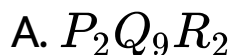
Answer: A



Watch Video Solution

10. Three atoms P, Q and R crystallize in a cubic solid lattice where P atoms are at the alternate faces, R atoms are at the centre of

edges and Q atoms are at the $\frac{2}{3}$ rd of the total corners present, hence the formula of the compound is



Answer: B



Watch Video Solution

11. A compound formed by elements X, Y and Z has a cubic structure in which X atoms are at the corner of the cube and also at alternate face centres. Y atoms are present at the body centre and Z atoms are present at the alternate edge centre. Then the molecular formula of the compound is

A. XYZ

B. XY_2Z

C. XYZ₃

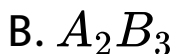
D. X_2YZ

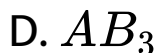
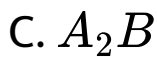
Answer: D



Watch Video Solution

12. An ionic compound is made up of A & B only. Ions A occupy all the corners and alternate edge centers while atoms B occupy all the face centers. The formula of compound will be





Answer: B



Watch Video Solution

13. An ionic compound is made up of A & B only. Ions of A occupy all the corners and alternate face centers while that of B occupy body center and edge centers. If B contains -1 charge then charge on atom A will be

A. +1

B. +2

C. +3

D. +4

Answer: B



Watch Video Solution

14. Which one of the following schemes of ordering closed packed sheets of equal sized spheres do not generate closet packed lattice?

A. ABCABC

B. ABACABAC

C. ABBAABBA

D. ABCBCABCBC

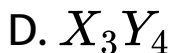
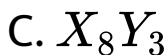
Answer: C



Watch Video Solution

15. If the anions (X) form hexagonal closed packing and cations (Y) occupy only $\frac{3}{8}$ th of

octahedral voids in it, then the general formula of the compound is

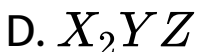
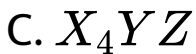
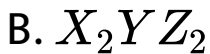
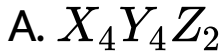


Answer: C



Watch Video Solution

16. A solid is formed and it has three types of atoms X, Y, Z. X forms an FCC lattice with Y atoms occupying one-fourth of tetrahedral voids and Z atoms occupying half of the octahedral voids. The formula of the solid is



Answer: D



Watch Video Solution

17. The two ions A^+ and B^- have radii 40 pm and 120 pm respectively. In the closed packed crystal of compound AB, the coordination number of A^+ would be

A. 6

B. 8

C. 4

D. 12

Answer: C



Watch Video Solution

18. A crystal is made of particles X,Y and Z.X form fcc packing . Y occupies all the octahedral void of X and Z occupies all the tetrahedral voids of X . If all the particles along one body diagonal are removed then the formula of the crystal would be:

A. ABC_2

B. $A_2 B C_2$

C. $A_8 B_4 C_5$

D. $A_5 B_4 C_8$

Answer: D



Watch Video Solution

19. The number of nearest neighbours of each atom in cubic close packing (ccp) and body-centred cubic arrangement (bcc) is respectively

A. 12, 12

B. 12, 8

C. 8, 6

D. 8, 8

Answer: B



Watch Video Solution

20. Minimum distance between two tetrahedral voids if a is the edge length of the cube is

A. $\frac{a}{4}$

B. $\frac{a}{2\sqrt{2}}$

C. $\frac{a}{2}$

D. $\frac{\sqrt{3a}}{4}$

Answer: C



Watch Video Solution

21. The distance between an octahedral and tetrahedral void in fcc lattice would be:

A. $a\sqrt{3}$

B. $\frac{a\sqrt{3}}{2}$

C. $\frac{a\sqrt{3}}{3}$

D. $\frac{a\sqrt{3}}{4}$

Answer: D



Watch Video Solution

22. You are given 6 identical balls . The maximum number of square voids and

triangular voids (in separate arrangements)

that can be created respectively are

A. 2, 4

B. 4, 2

C. 4, 3

D. 3, 4

Answer: A



Watch Video Solution

23. The number of octahedral voids in case of hcp unit cell is

A. 6

B. 12

C. 4

D. 8

Answer: A



Watch Video Solution

24. The number of nearest neighbours of each sphere in hexagonal closed packing pattern in its own layer will be

A. 4

B. 6

C. 12

D. 8

Answer: B



Watch Video Solution

25. In an arrangement of type ABABA ... identical atoms of first layer (A) and third layer (A) are joined by a line passing through their centers . Identify the correct statement .

A. No void is found on the line

B. Only tetrahedral voids are found on the
line

C. Only octahedral voids are found on the
line

D. Equal number of tetrahedral and octahedral voids are found on the line

Answer: B



Watch Video Solution

26. Given an alloy of Cu, Ag and Au in which Cu atoms constitute the ccp arrangement . If the hypothetical formula of the alloy is Cu_4Ag_3Au , the probable locations of Ag and Au atoms are

A. Ag- all tetrahedral voids , Au - all octahedral voids

B. Ag- $\frac{3}{8}$ th tetrahedral voids , Au - $\frac{1}{4}$ th octahedral voids

C. Ag- $\frac{1}{2}$ octahedral voids , Au - $\frac{1}{2}$ tetrahedral voids

D. Ag- all octahedral voids , Au - all tetrahedral voids

Answer: B



Watch Video Solution

27. Which of the following statement is false ?

A. Two tetrahedral voids are formed on each of the four body diagonals of the cube

B. When body centre of the cube is surrounded by six atoms of face centres , an octahedral voids is formed .

C. Tetrahedral void is present at the centre of each of the 12 edges

D. The shortest distance between two octahedral voids is $a/\sqrt{2}$ (a is the edge length of the unit cell).

Answer: C



Watch Video Solution

28. A TV in fcc is formed by atoms at

A. 3 corners and 1 face centre

B. 3 face centres and 1 corner

C. 2 face centres and 2 corners

D. 2 face centres , 1 corner and 1 body
centre

Answer: B



Watch Video Solution

29. Relationship between atomic radius and the edge length a of a body-centred cubic unit cell is

A. $r = \frac{a}{2}$

B. $r = \frac{a}{2\sqrt{2}}$

C. $r = \frac{a\sqrt{3}}{4}$

D. $\frac{\sqrt{2}a}{2}$

Answer: B



Watch Video Solution

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

A. $\frac{\pi}{2}$

B. $\frac{\sqrt{3}\pi}{8}$

C. $(\sqrt{2}\pi)6$

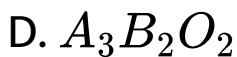
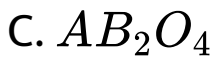
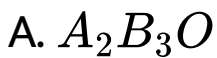
D. $\frac{\pi}{6}$

Answer: D



Watch Video Solution

31. In a close packed structure of mixed oxides, the lattice is composed of oxide ions, one-eighth of tetrahedral voids are occupied by divalent cations while one-half of octahedral voids are occupied by trivalent cations. The formula of the oxide is



Answer: C



Watch Video Solution

32. An ionic solid $A^{\oplus}B^{\ominus}$ crystallizes as an bcc structure. The distance between cation and anion in the lattice is $338 \pm$. The edge length of cell is

A. 195.15 pm

B. 97.58 pm

C. 390.3 pm

D. 780.6 pm

Answer: C



Watch Video Solution

33. In a metal M having bcc arrangement edge length of the unit cell is 400 pm . The atomic radius of the metal is

A. 173 pm

B. 100 pm

C. 141 pm

D. 200 pm

Answer: A



Watch Video Solution

34. A compound XY crystallizes in BCC lattice with unit cell - edge length of 480 pm , if the radius of Y is 225 pm , then the radius of X is

A. 95.34 pm

B. 225 pm

C. 127.5 pm

D. 190.7 pm

Answer: D



Watch Video Solution

35. What are the number of atoms per unit cell and the number of nearest neighbours in a body centered cubic structure?

A. 2, 12

B. 4, 12

C. 2, 8

D. 2, 6

Answer: C



Watch Video Solution

36. An element crystallizes in a face centered cubic lattice and the edge of the unit cell is

0.559nm. The density is $3.19\text{g}/\text{cm}^3$. What is the atomic mass?

A. 100.6

B. 75.9

C. 95.8

D. 83.9

Answer: D



Watch Video Solution

37. An element X (At. mass = 80 g/mol) has fcc structure. Calculate no. of unit cells in 8 gm of X:

A. $0.4 \cdot N_A$

B. $0.1 \cdot N_A$

C. $4 \cdot N_A$

D. $0.025 \cdot N_A$

Answer: D



Watch Video Solution

38. Molybdenum ($\text{At. mass} = 96 \text{ g/mol}^{-1}$) crystallizes as bcc crystal. If density of crystal is 10.3 g/cm^3 , then radius of Mo atoms ($\text{use } N_A = 6 \times 10^{23}$):

A. 111 pm

B. 314 pm

C. 138.56 pm

D. 314 pm

Answer: C



Watch Video Solution

39. The coordination number of metal crystallising in a hexagonal close packing is

A. 12

B. 8

C. 6

D. 4

Answer: A



Watch Video Solution

40. The unit cell present in ABCABC, closet packing of atoms is:

- A. Hexagonal
- B. Tetragonal
- C. Face centred cube
- D. Simple cube

Answer: C



Watch Video Solution

41. The atomic radius of strontium (Sr) is 215pm and it crystallizes with a cubic close packing. Edge length of the cube is :

A. 430 pm

B. 608.2 pm

C. 496.53 pm

D. 304.1 pm

Answer: B



Watch Video Solution

42. Crystalline CsCl has density 3.988 g cm^{-3}

.The volume occupied by single CsCl ion pair in the crystal will be

A. $7.01 \cdot 10^{-23} \text{ cm}^3$

B. $6.02 \cdot 10^{-24} \text{ cm}^3$

C. 1 cm^3

D. $3.5 \cdot 10^{-23} \text{ cm}^3$

Answer: A



Watch Video Solution

43. A binary solid (AB) has a rock salt structure . If the edge length is 500 pm , and radius of cation is 80 pm , find the radius of anion

A. 100 pm

B. 120 pm

C. 250 pm

D. 170 pm

Answer: D



Watch Video Solution

