21. The number of spheres contained (i) in one body centred cubic unit cell and (ii) in one face centred cubic unit cell, is

(a) In (i) 2 and in (ii) 4 (b) In (i) 3 and in (ii) 2

(c) In (i) 4 and in (ii) 2 (d) In (i) 2 and in (ii) 3

22. $CsBr$ crystal has bcc structure. It has an edge length of $4.3\ \mathring{A}$. The shortest interionic distance between Cs^+ and Br^- ions is

(a) $1.86\ \mathring{A}$ (b) $3.72\ \mathring{A}$

(c) $4.3\ \mathring{A}$ (d) $7.44\ \mathring{A}$

23. In octahedral holes (voids)

(a) A simple triangular void surrounded by four spheres

(b) A bi-triangular void surrounded by four spheres

(c) A bi-triangular void surrounded by six spheres

(d) A bi-triangular void surrounded by eight spheres

24. Bragg's law is given by the equation|

(a) $n\lambda = 2\theta \sin\theta$ (b) $n\lambda = 2d \sin\theta$

(c) $2n\lambda = d \sin\theta$ (d) $n\frac{\theta}{2} = \frac{d}{2}\sin\theta$

25. The number of atoms in $100\ g$ of an fcc crystal with density $d = 10\ g/cm^3$ 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}

26. In the crystals of which of the following ionic compounds would you expect maximum distance between centres of cations and anions

(a) LiF (b) CsF

(c) CsI (d) LiI

27. 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}

28. How many unit cells are present in a cube-shaped ideal crystal of $NaCl$ of mass $1.00\ g$ [Atomic masses: $Na = 23, Cl = 35.5$]

(a) 2.57×10^{21} unit cells (b) 5.14×10^{21} unit cells

(c) 1.28×10^{21} unit cells (d) 1.71×10^{21} unit cells

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

(a) Quantum number (b) An integer

(c) Avogadro's numbers (d) Moles

30. In a face centred cubic cell, an atom at the face contributes to the unit cell

(a) 1/4 part (b) 1/8 part

(c) 1 part (d) 1/2 part

31. The interionic distance for cesium chloride crystal will be

(a) a (b) $\frac{a}{2}$

(c) $\frac{\sqrt{3}a}{2}$ (d) $\frac{2a}{\sqrt{3}}$

32. Sodium metal crystallizes as a body centred cubic lattice with the cell edge 4.29 Å. What is the radius of sodium atom

(a) $1.857 \times 10^{-8}\ cm$ (b) $2.371 \times 10^{-7}\ cm$

(c) $3.817 \times 10^{-8}\ cm$ (d) $9.312 \times 10^{-7}\ cm$

33. 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

34. Potassium has a bcc structure with nearest neighbour distance $4.52\ \mathring{A}$. Its atomic weight is 39. Its density (in $kg\ m^{-3}$) will be

(a) 454 (b) 804

(c) 852 (d) 908

35. 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

36. The number of atoms/molecules contained in one face centred cubic unit cell of a monoatomic substance is

(a) 1 (b) 2

(c) 4 (d) 6

37. The number of atoms/molecules contained in one body centered cubic unit cell is

(a) 1 (b) 2

(c) 4 (d) 6

38. It the distance between Na^+ and Cl^- ions in sodium chloride crystal is X pm, the length of the edge of the unit cell is

(a) 4X pm (b) X/4 pm

(c) X/2 pm (d) 2X pm

39. The edge of unit cell of FCC Xe crystal is $620\ pm$. The radius of Xe atom is

(a) 219.25 Pm (b) 235.16 Pm

(c) 189.37 Pm (d) 209.87 Pm

40. In orthorhombic, the value of a, b and c are respectively $4.2\mathring{A}, 8.6\mathring{A}$ and $8.3\mathring{A}$. given the molecular mass of the solute is $155\ gm\ mol^{-1}$ and that of density is $3.3\ gm/cc$, the number of formula units per unit cell is

(a) 2 (b) 3

(c) 4 (d) 6