Solution (Class-12th Chemistry)

1. If Raoult's law is obeyed, the vapour pressure of the solvent in a solution is directly proportional to
(1) Mole fraction of the solvent (2) Mole fraction of the solute
(3) Mole fraction of the solvent and solute (4) The volume of the solution

2. 1 mole of heptane (V. P. = 92 mm of Hg) was mixed with 4 moles of octane (V. P. =3Imm of Hg). The vapour pressure of resulting ideal solution is:
(1) 46.2 mm of Hg (2) 40.0 mm of Hg (3) 43.2 mm of Hg (4) 38.4 mm of Hg

3. The vapour pressure of a dilute aqueous solution of Glucose is 750 mm of mercury at 373 K. The mole fraction of solute is
(1) $\frac{1}{10}$ (2) $\frac{1}{7.6}$ (3) $\frac{1}{35}$ (4) $\frac{1}{76}$

4. The vapour pressure of a pure liquid 'A' is 70 torr at 27° C. It forms an ideal solution with another liquid B. The mole fraction of B is 0.2 and total vapour pressure of the solution is 84 torr at 27° C. The vapour pressure of pure liquid B at 27°C is -
(1) 14 (2) 56 (3) 140 (4) 70

5. The vapour pressure of pure A is 10 torr and at the same temperature when 1 g of B is dissolved in 20 gm of A, its vapour pressure is reduced to 9.0 torr. If the molecular mass of A is 200 amu, then the molecular mass of B is:
(1) 100 amu (2) 90 amu (3) 75 amu (4) 120 amu

6. Which condition is not satisfied by an ideal solution
(1) ΔH mixing = 0 (2) Δ V mixing = 0
(3) Δ S mixing = 0 (4) Obeyance of Raoult's law

7. The boiling point of $C_6H_6, CH_3OH, C_6H_5NH_2$, and $C_6H_5NO_2$ are $80^0C, 65^0C, 184^0C$ and 212^0C respectively. Which will show highest vapour pressure at room temperature:
(1) C_6H_6 (2) CH_3OH (3) $C_6H_5NH_2$ (4) $C_6H_5NO_2$

8. The mole fraction of the solute in one molal aqueous solution is
(1) 0.027 (2) 0.036 (3) 0.018 (4) 0.009

9. The vapour pressure of two liquids 'P' and 'Q' are 80 and 60 torr, respectively. The total vapour pressure of solution obtained by mixing 3 mole of P and 2 mol of Q would be :
(1) 68 torr (2) 140 torr (3) 72 torr (4) 20 torr

10. A solution has a 1: 4 mole ratio of pentane to hexane. The vapour pressures of the pure hydrocarbons at 20 C are 440 mmHg for pentane and 120 mmHg for hexane. The mole fraction of pentane in the vapour phase would be
(1) 0.200 (2) 0.478 (3) 0.549 (4) 0.786

11. A mixture of ethyl alcohol and propyl alcohol has a vapour pressure of 290 mm at 300 K. The vapour pressure of propyl alcohol is 200 mm. If the mole fraction of ethyl alcohol is 0.6, its vapour presure (in mm) at the same temperature will be
(1) 300 (2) 700 (3) 360 (4) 350

12. 25.3 g of sodium carbonate, Na_2CO_3 is dissolved in enough water to make 250 mL of solution. If sodium carbonate dissociates completely, molar concentration of sodium ion, Na^+ and carbonate ions, CO_3^{2-} are respectively Na_2CO_3 106 g mol^{-1})
(1) 0.477 M and 0.477 M (2) 0.955 M and 1.910 M
(3) 1.910 M and 0.955 M (4) 1.90 M and 1.910 M

13. For an ideal solution of A and B which statement is incorrect
(1) The enthalpy change of mixing of A and B is zero
(2) The volume change of solution A and B is zero
(3) The intermolecular forces ot A and B is same as that of A-A and B-B
(4) The entropy change of mixture of A and B is zero

14. P_A and P_B are the vapour pressure of pure liquid components, A and B, respectively of an ideal binary solution. If $\times_A$ represents the mole traction of component A, the total pressure of the solution will be.
(1) $P_B + \times_A (P_B - P_A)$ (2) $P_B + \times_A (P_A - P_B)$ (3) $P_A + \times_A (P_B - P_A)$ (4) $P_A + \times_A (P_A - P_B)$