Vidyasagar school ,Indore
Summer Assignment (2026-27)
Class-XII
Subject-Chemistry(043)

Answer the following questions

1	Define:Molarity (M) , Molality (m) and Mole fraction (x)	
2	What are non-ideal solutions? Explain positive and negative deviation.	
3	Explain the solubility rule “like dissolves like” in terms of intermolecular forces that exist in solutions.	
4	What is the significance of Henry’s Law constant K_H?	
5	(a) Explain the following phenomena with the help of Henry’s law. (i) Painful condition known as bends. (ii) Feeling of weakness and discomfort in breathing at high altitude. (b) Why does soda water bottle kept at room temperature fizzes on opening?	
6	Explain the terms ideal and non-ideal solutions in the light of forces of interactions operating between molecules in liquid solutions.	
7	When kept in water, raisins swell in size. Name and explain the phenomenon involved. Give three applications of the phenomenon.	
8	Explain Raoult’s law for binary solutions (with graph).	
9	1 g of a non-volatile solute is dissolved in 100 g of water. The boiling point is raised by 0.52 K. Given Kb=0.52 K kg mol−1K_b = 0.52 \, K\,kg\,mol^{-1}Kb=0.52Kkgmol−1, find the molar mass of the solute	
10	Calculate the freezing point of a solution containing 5 g of glucose in 100 g of water. Given Kf=1.86 K kg mol−1K_f = 1.86 \, K\,kg\,mol^{-1}Kf=1.86Kkgmol−1	
11	Calculate the osmotic pressure of a solution at 300 K containing 0.1 mol of solute in 1 L solution. Use R=0.0821 L atm K−1 mol−1R = 0.0821 \, L\,atm\,K^{-1}\,mol^{-1}R=0.0821LatmK−1mol−1	
12	0.5 g of a solute dissolved in 100 g of benzene lowers the freezing point by 0.4 K. Given Kf=5.12 K kg mol−1K_f = 5.12 \, K\,kg\,mol^{-1}Kf=5.12Kkgmol−1 Calculate the molar mass of the solute.	
13	Explain how the solubility of gases in liquids is influenced by pressure.	
14	The solubility of a gas in water at 298 K is 0.02 mol/L0.02 \, mol/L0.02mol/L at a pressure of 1 atm. Find the solubility at 5 atm (temperature constant).	
15	The vapour pressure of pure benzene is 100 mm Hg. A non-volatile solute is added so that mole fraction of solute = 0.2. Calculate the vapour pressure of the solution.	

16	1 g of a non-volatile solute is dissolved in 50 g of benzene. Vapour pressure decreases from 80 mm Hg to 76 mm Hg. Find molar mass of solute.	
17	A solution is prepared by dissolving 20 g of NaCl in water to make 500 mL of solution. Calculate the molarity of the solution. (Molar mass of NaCl = 58.5 g/mol)	
18	A solution is made by dissolving 10 g of urea (NH_2CONH_2) in 200 g of water. Calculate the molality of the solution. (Molar mass of urea = 60 g/mol)	
19	A solution contains 20 g of NaCl dissolved in 100 g of water. Calculate the mole fraction of NaCl and the molality of the solution.	
20	A student prepares a solution by dissolving 10 g of glucose ($C_6H_{12}O_6$) in 100 g of water at 298 K. He observes that the vapor pressure of the solution is lower than that of pure water. (a) Why is the vapor pressure of the solution lower than pure water? (b) Identify the type of solution behavior shown here. (c) What law explains this observation? (d) Is glucose a volatile or non-volatile solute?	
21	Multiple choice questions: (i)According to Raoult's law, the vapour pressure of a solution is directly proportional to: A. Mole fraction of solute B. Mole fraction of solvent C. Mass of solute D. Volume of solution (ii) Which of the following shows negative deviation from Raoult's law? A. Ethanol + acetone B. Benzene + toluene C. Acetone + chloroform D. Ideal solution (iii) Which is NOT a colligative property? A. Elevation in boiling point B. Depression in freezing point C. Osmotic pressure D. Viscosity (iv) Reverse osmosis occurs when pressure applied is: A. Equal to osmotic pressure B. Less than osmotic pressure C. Greater than osmotic pressure D. Zero (v) Van't Hoff factor is: A. Always equal to 1 B. Ratio of observed to theoretical colligative property	

	C. Mass of solute / volume of solution D. Mole fraction of solute	
**	To prepare investigatory project(Topics prescribed by CBSE)	