Bhartiyam International School

Pre – Mid Term Assessment (2022-23)
Subject: Chemistry
Class: XII

Date: 14/07/2022 **M.M: 40**
Name: _____ **Roll No: _____** **Duration:90 mins**

General instructions:-

- This question paper contain 3 sections.
- **SECTION A** consist of five questions carrying **1** mark each.
- **SECTION B** consist of five questions carrying **3** marks each.
- **SECTION C** consist of four questions carrying **5** marks each.

SECTION- A

Q.1- Salt water fish die when they suddenly transferred to a fresh water aquarium, why? 1

Q.2- Non- ideal solutions exhibit either positive or negative deviations from Raoult's law. Give one example for each deviation. 1

Q.3- 0.216 molal solution of cadmium sulphate is prepared in 1000 gram of water. The depression in freezing point was measured to be 0.284 K. calculate Van't hoff factor. The cryoscopic constant for water is 1.86 KKg/mol 1

Q.4- Give 2 examples of solid solutions. 1

Q.5- What is ebullioscopic constant. 1

SECTION- B

Q.6- 15.0 g of an unknown molecular material is dissolved in 450 g of water. The resulting solution freezes at –0.34 °C. What is the molar mass of the material ? (K_f for water = 1.86 K kg mol^{-1}) 3

Q.7- Define the following terms:

(i) Mole fraction (ii) Minimum boiling azeotrope (iii) Osmotic pressure 3

Q.8- When 2.56 g of sulphur was dissolved in 100 g of CS_2, the freezing point lowered by 0.383 K Calculate the formula of sulphur (S_x). (K_f for CS_2 = 3.83 K kg mol^{-1}, Atomic mass of Sulphur = 32 g mol^{-1}) 3

Q.9- A 1 molal aqueous solution of trichloroacetic acid (CCl_3COOH) is heated to its boiling point. The solution has the boiling point 100.18 °C. Determine the van't Hoff factor for trichloroacetic acid. (K_b for water = 0.512 K kg mol^{-1}) 3

Q.10- An aqueous solution of sodium chloride freezes below 273 K. Give the statement and formula for lowering in freezing point with the help of a suitable diagram. 3

SECTION- C

Q.11- 100 mg of a protein is dissolved in enough water to make 10.0 ml of a solution. If this solution has an osmotic pressure of 13.3 mm Hg at 25°C, what is the molar mass of protein?
(R = 0.0821 L atm mol^{-1} K^{-1} and 760 mm Hg = 1 atm) 5

Q.12- Differentiate volatile and non-volatile substances. state Raoult's law for the solution containing volatile components. What is the similarity between Raoult's law and Henry's law? 5

Q.13- What do you mean by van't hoff factor? How will you relate van't hoff factor with degree of dissociation? Give van't hoff equations. 5

Q.14- The vapour pressures of benzene and toluene at 293K are 75 mm Hg and 22 mm Hg respectively. 23.4 g of benzene and 64.4 g of toluene are mixed. If the two form an ideal solution, calculate the mole fraction of benzene in the vapour phase assuming that the vapour pressures are in equilibrium with the liquid mixture at this temperature. 5