INDIAN SCHOOL DARSAIT

DEPARTMENT OF CHEMISTRY

Subject: Chemistry	Topic : Solutions	Date of Worksheet: 20.4.2018
Resource Person: SREEKALA M		Date of Submission:_____
Name of the Student: _____ Class &Division: XII		Roll Number: _____

1.	What is the Van't Hoff factor for a compound which undergoes tetramerisation in an organic solvent?	1
2.	State Raoult's law for a solution containing non-volatile solute	1
3.	Which aqueous solution has higher concentration- 1 molar or 1 molal solution of the same solute? Give reason.	1
4.	Give reason why 10ml of ethyl alcohol and 10ml of water are mixed, the volume of the resultant solution is more than 20ml?	1
5.	Which of the following has higher boiling point and why? 0.1MNaCl 0r 0.1M Glucose.	1
6.	i)Differentiate between molarity and molality of a solution. ii)Explain how molarity value of a solution can be converted into its molality. iii)What is the effect of rise in temperature on molality and molarity of the solution.?	2
7.	Derive the relationship between relative lowering of vapour pressure and mole fraction of the non-volatile solute.	2
8.	State Henry's Law and mention two of its applications.	2
9.	What type of deviation is shown by a mixture of i) phenol and aniline ii) Ethanol and acetone. iii)Chloroform and acetone iv) Carbon disulphide and acetone.	2
10.	Define azeotropes and explain briefly minimum boiling point azeotrope by taking suitable example.	2
11.	A 0.561 m solution of an unknown electrolyte depresses the freezing point of water by 2.93^0 C. What is the Van't Hoff factor for this electrolyte? The freezing point depression constant. K_f for water is $1.86 KKgmol^{-1}$.	2
12.	0.5g KCl was dissolved in 100g water and the solution originally at 20^0C, froze at -0.24^0C. Calculate the percentage ionization of salt. K_f per 1000g of water= 1.86K	2
13.	Ethylene glycol (molar mass=$62 gmol^{-1}$) is a common automobile antifreeze. Calculate the freezing point of a solution containing 12.4g of this substance in 100g of water. Would it be advisable to keep this substance in the car radiator during summer. Given K_f for water= 1.86KKg/mol K_b for water =0.512KKg/mol.	2

14.	Give reasons for the following: a)At higher altitudes, people suffer from a disease called anoxia. In this disease, they become weak and cannot think clearly. b)When mercuric iodide is added to an aqueous solution of KI, the freezing point is raised.	2
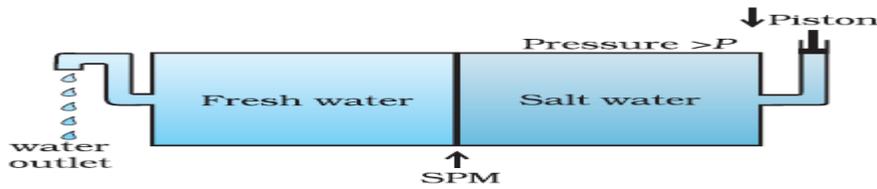
15.	
	    i) Name and define the process occurring in the above plant.
	    ii) To which container does the net flow of solvent take place.
	    iii) Name one SPM which can be used in the plant.
	    iv) Give one practical use of the plant.	

16.	State Raoult's law for solutions of volatile liquids. Taking suitable examples, explain the meaning of positive and negative deviations from Raoult's law.	2
17.	Define osmotic pressure of a solution. Describe how the molecular mass of a substance can be determined by a method based on osmotic pressure measurement.	2
18.	An electrolyte AB is 50% ionized in aqueous solution. Calculate the freezing point of 1 molal aqueous solution. Given K_f for water= 1.86KKg/mol	2
19.	Calculate the freezing point of a solution containing 60g of glucose(Molar mass =180g/mol)in 250g of water.	2
20.	A 5% solution of sucrose is isotonic with 3% solution of an unknown organic substance. Calculate the molecular mass of the unknown substance.	2
21.	A solution containing 8g of a substance in 100g of diethyl ether boils at 36.86^0C, whereas pure ether boils at 35.60^0C. Determine the molecular mass of the solute. For ether K_b= 20.2K Kg mol^{-1}	3
22.	Calculate the temperature at which a solution containing 54g of glucose, $C_6H_{12}O_6$ in 250g of water will freeze. (K_f for water=1.86 K Kg mol^{-1})	3
23.	Menthol is a crystalline substance with peppermint taste. A 2.6% solution of menthol in cyclohexane freezes at -1.95^{0}C. Determine the formula mass of menthol. The freezing point and molal depression constant of cyclohexane are 6.5 ^{0}C and 20.2KKgmol^{-1}, respectively.	3
24.	A solution prepared from 1.25 g of oil of wintergreen(methyl salicylate) in 99g of benzene has a boiling point of 80.31^{0}C. Determine the molar mass of this compound. (Boiling point of pure benzene=80.10^{0}C and K_b for benzene =2.53^{0}CKgmol^{-1})	3
25.	Give reasons for the following: a)Measurement of osmotic pressure method is preferred for the determination of molar masses of macromolecules such as proteins and polymers. b)Aquatic animals are more comfortable in cold water than in warm water. c)Elevation of boiling point of 1M KCl solution is nearly double than that of 1M sugar solution.	3
26.	What mass of NaCl (molar mass =58.5gmol^{-1} must be dissolved in 65gof water to lower the freezing point by 7.50^{0}C? The freezing point depression constant, K_f for water is 1.86KKgmol^{-1}. Assume Van't Hoff factor for NaCl is 1.87.	3
27.	Benzoic acid completely dimerises in benzene. What will be the vapour pressure of a solution containing 61g of benzoic acid per 500g benzene when the vapour pressure of pure benzene at the temperature of experiment is 66.6 torr. What would have been the vapour pressure in the absence of dimerisation?	3