**Karan Arora** **R.L. Chemistry Classes M: 99968-68554**

**Max Time : 1 hr** **Class = 12th Chemistry Test**  **Max Marks : 30**

**SOLUTION**

1. Multiple choice questions : [ 1 X 5 = 5]
2. An example of colligative property :

|  |  |  |  |
| --- | --- | --- | --- |
| a) freezing point | b) boiling point | c) vapour pressure | d) osmotic pressure |

1. In cold countries, ethylene glycol is added to water in the radiators of cars during winters. It results in reducing:

|  |  |  |  |
| --- | --- | --- | --- |
| a) viscosity | b) specific heat | c) freezing point | d) boiling point |

1. Calculate the percentage degree of dissociation of an electrolyte AB2 (normal molar mass = 164) in H2O, if observed molar mass is 65.6

|  |  |  |  |
| --- | --- | --- | --- |
| a) 50 % | b) 25 % | c) 75 % | d) None |

1. Which of the following solution will have highest freezing point :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 M urea | b) 1 M Na2SO4 | c) 1 M NaCl | d) 1 M Al2(SO4)3 |

1. In a solution of 7.8 g benzene (C6H6) and 46 g toluene (C6H5CH3), the mole fraction of benzene is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1/6 | b) 1/5 | c) 1/2 | d) 1/3 |

1. A sample of drinking water was found to be severely contaminated with chloroform, CHCl3 supposed to be carcinogen. The level of contaminated was 15 ppm (by mass). [ 2 ]

(i) Express this in percentage by mass (ii) Determine the molality of chloroform in the water sample

1. What happens when the external pressure applied becomes more than the osmotic pressure of the solution?

[ 2 ]

1. What are isotonic solutions? Give example. [ 2 ]
2. One litre of N/2 HCl solution is heated in a beaker. It was observed that when the volume of the solution was reduced to 600 mL, 3.25 g of HCl is lost. Calculate the normality of the new solution. [ 2 ]
3. Write two differences between a solution showing positive deviation and a solution showing negative deviation from Raoult’s law. [ 2 ]
4. A solution is prepared by dissolving 8.95 mg of a gene fragment in 35 mL of water has an osmotic pressure of 0.335 torr at 25. Assuming that the gene fragment is a non-electrolyte. Calculate its molar mass. [ 3 ]
5. A solution containing 8.6 g urea in one litre was found to be isotonic with 0.5 % (w/v) solution of an organic non-volatile solute. Calculate the molecular weight of organic solute? [ 3 ]
6. (i) What is de-icing agent? How does it function?

(ii) 19.5 g of CH2FCOOH is dissolved in 500 g of water. The depression in freezing point of water observed is 1. Calculate the Van’t Hoff factor and dissociation constant of fluoroacetic acid. [ 3 ]

1. The osmotic pressure of a urea solution in 500 mm of Hg at 10. The solution is diluted and its temperature is raised to 25. It is now found that osmotic pressure of the solution is reduced to 105.3 mm of Hg. Determine the extent of dilution of the solution. [ 3 ]
2. To 500 cm3 of water, 3 x 10 – 3 kg of acetic acid is added. If 23 % of acetic acid is dissociated, what will be the depression in freezing point? Kf and density of water are 1.86 K kg mol – 1 and 0.997 g/cm3 respectively. [ 3 ]