# ASSIGNMENT -1

Question -1 The following questions are multiple choice questions. Choose the most appropriate answer

(i) Name and define the process/method which is used for purification of water?

(ii) Which colligative property is most suitable to measure molecular mass of proteins and why?

(iii) 200 cm3 of an aqueous solution of a protein contains 1.26 g of the protein. The osmotic pressure of such a solution at 300 K is found to be 2.57 × 10-3 bar. Calculate the molar mass of the protein.

**OR**

A solution contains 0.8960g of K2SO4 in 500ml solution. Its osmotic pressure is found to be 0.690atm at 270C. Calculate the value of Van't Hoff factor. (K=39.0, S=32, O=16, R=0.082atm mol-1K-1)

Question 2-i) What type of liquids form the ideal solution?

(ii) Give one example of an ideal solution.

(iii) (a) Write two characteristics of a non-ideal solution.

(b) Which type of deviation will be shown by the solution if yAB < yAA.

**OR**

Plot a graph between vapour pressure and mole fraction of a non-ideal solution showing positive and negative deviations from an ideal solution.

Question 3- (i) Two liquids A and B on mixing form an ideal solution. At 300C vapour pressure of solution containing 3 mol of A and 1 mol of B is 550 mmHg. But when 4 mol of A and 1 mol of B are mixed. The vapour pressure of solution thus formed is 560 mm Hg. What would be the V.P of pure A and B?

(ii) Explain the fact that Raoult's Law is a special case of Henry's Law.

(iii) According to Raoult's law, the vapour pressure of a volatile component in a given solution is given by pi = xi pi0.

Question 4-(a) Why is glycol and water mixture used in car radiators in cold countries?

(b) Give reason When 30 ml of ethyl alcohol and 30ml of water are mixed, the volume of resulting solution is more than 60ml.

(c) Define cryoscopic constant?

**OR**

(d) State (i) Azeotropes and (ii) Henry's Law constant.

Question 5- A solution containing 18 g of non-volatile solute in 200g of water freezes at 272.07 K. calculate the molecular mass of solute (given Kf = 1.86 K/m)

**OR**

Calculate the osmotic pressure at 270C of a solution formed by mixing equal volumes of two solutions, one containing 0.05 mole of glucose in 250 ml of solution and the other containing 3.42 g of C12H22O11 in 250 ml of solution. [R = 0.082 L atm mol-1K-1]