Chapter 01 Solution

TOPIC WISE QUESTIONS

CONCENTRATION TERMS

Q.1 What is the mole fraction of glucose in 10% w/w glucose solution?
(1) 0.01 (2) 0.02 (3) 0.03 (4) 0.04

Q.2 In a normal solution of $BaCl_2$, normalities of Ba^{2+} and Cl^- are in the ratio
(1) 2:1 (2) 1:2 (3) 1:1 (4) 2:3

Q.3 What is the normality of 2M H_3PO_2 solution?
(1) 0.5 N (2) 1.0 N
(3) 2.0 N (4) 3.0 N

Q.4 How many grams of HNO_3 is required to prepare 400 ml solution of 0.2 M HNO_3?
(1) 5.04 g (2) 5040 g
(3) 25.2 g (4) 2.52 g

Q.5 Calculate normality of 2.1% (w/V) H_2SO_4 solution?
(1) 2.14 N (2) 4.28 N
(3) 0.428 N (4) 0.214 N

Q.6 20.6 g NaBr is dissolved in 500 ml solution what is the molarity of resulting solution?
(1) 0.6 (2) 0.4 (3) 1 (4) None

Q.7 Density of 2.03 M aqueous solution of acetic acid is 1.017 g mL^{-1} molecular mass of acetic acid is 60. Calculate the molality of solution?
(1) 2.27 (2) 1.27 (3) 3.27 (4) 4.27

Q.8 A molar solution is one that contains one mole of solute in:
(1) 1000 g of the solvent
(2) one litre of the solution
(3) 1000 g of the solution
(4) 22.4 litres of the solution

Q.9 Mole fraction of glycerine($C_3H_5(OH)_3$) in a solution of 36 g of water and 46 g of glycerine is:
(1) 0.46 (2) 0.36
(3) 0.20 (4) 0.40

Q.10 1000 g aqueous solution of $CaCO_3$ contains 10 g of calcium carbonate concentration of the solution is:
(1) 10 ppm (2) 100 ppm
(3) 1000 ppm (4) 10,000 ppm

Q.11 Normality of 0.3 M phosphorous acid is:
(1) 0.15 (2) 0.6 (3) 0.9 (4) 0.1

Q.12 Molarity of 720 gm of pure water:
(1) 40M (2) 4M
(3) 55.5M (4) Can't be determined

Q.13 Equal weight of NaCl and KCl are dissolved separately in equal volumes of solutions molarity of the two solutions will be:
(1) Equal
(2) That of NaCl will be less than that of KCl
(3) That of NaCl will be more than that of KCl Solution
(4) That of NaCl will be half of that of KCl solution

Q.14 Mole fraction of ethanol in ethanol water mixture is 0.25. Hence percentage concentration of ethanol by weight of mixture is:
(1) 25% (2) 75% (3) 46% (4) 54%

Q.15 H_2O_2 solution used for hair bleaching is sold as a solution of approximately 5.0 gm H_2O_2 per 100 mL of the solution. The molecular mass of H_2O_2 is 34. The molarity of this solution is approximately:
(1) 0.15 M (2) 1.5 M
(3) 3.0 M (4) 3.4 M

Q.16 How much water should be added to 200 cc of semi normal solution of NaOH to make it exactly decinormal:
(1) 1000 cc (2) 400 cc
(3) 800 cc (4) 600 cc

Q.17 100 ml of 0.3 N HCl solution is mixed with 200 ml of 0.6 N H_2SO_4 solution what is the normality of H_2SO_4 in the final solution?
(1) 0.9 (2) 0.6 (3) 0.5 (4) 0.4

Q.18 100 ml of 0.5 N NaOH solution is added to 10 ml of $3NH_2SO_4$ solution and 20 ml of 1N HCl solution. The mixture is:
(1) Acidic (2) Alkaline
(3) Neutral (4) None of these

Q.19 If 8.3 ml of a sample of H_2SO_4 (36 N) is diluted by 991.7 ml of water, the approximate normality of the resulting solution is:
(1) 0.4 (2) 0.2 (3) 0.1 (4) 0.3

Q.20 10 ml of an HCl solution gave 0.1435 gm of AgCl when treated with excess of $AgNO_3$. The normality of the HCl solution is:
(1) 0.1 (2) 3 (3) 0.3 (4) 0.2

Q.21 Equal volumes of 0.1 M $AgNO_3$ and 0.2 M NaCl are mixed. The concentration of NO_3^- ions in the mixture will be:
(1) 0.1 M (2) 0.05 M
(3) 0.2 M (4) 0.15 M

Q.22 Which of the following solutions has the highest normality?
(1) 8 grams of KOH per litre
(2) N phosphoric acid
(3) 6 g ms of NaOH per 100 ml
(4) 0.5 M H_2SO_4

Q.23 Hydrochloric acid solution A and B have concentration of 0.5 N and 0.1 N respectively. The volume of solutions A and B required to make 2 litres of 0.2 N HCl are:
(1) 0.5 lit. of A + 1.5 lit. of B
(2) 1.5 lit. of A + 0.5 lit. of B
(3) 1.0 lit. of A + 1.0 lit. of B
(4) 0.75 lit. of A + 1.25 lit. of B

Q.24 An aqueous solution of glucose is 10% in strength. The volume in which 2 gm mole of it is dissolved will be:
(1) 18 litre (2) 3.6 litre
(3) 0.9 litre (4) 1.8 litre

Q.25 A sugar syrup of mass 214.2 gm contains 34.2 gm of sugar. Calculate mole fraction of sugar in syrup.
(1) 0.556 (2) 0.01
(3) 9.90×10^{-3} (4) 0.156

Q.26 The molarity of a solution obtained by mixing 750 mL of 0.5(M)HCl with 250 mL of 2(M) HCl will:
(1) 0.875 M (2) 1.00 M
(3) 1.75 M (4) 0.975 M

Q.27 The concentration of a solution of H_2O_2 is 6.8% then the volume strength of the solution is:
(1) 22.4 (2) 11.2 (3) 20 (4) 5

Q.28 Which of the following statement is true: –
(a) Molarity is the no. of moles of solute dissolved per litre of solvent.
(b) The molarity and normality of a solution of sodium carbonate are same.
(c) Molality (m) of a solution is defined as the number of moles of solute dissolved is 1000 gm of solution
(d) The ratio of mole fraction of solute and solvent is in the ratio of their, respective moles.
(1) a & c (2) a & d
(3) b & c (4) Only d

Q.29 25 ml $\frac{N}{10}$ NaOH solution will exactly neutralize which of the following solution:
(1) 25 ml $\frac{N}{10}$ KOH solution
(2) 25 ml N H_2SO_4 solution
(3) 25 ml $\frac{N}{10}$ HCl solution
(4) 2.5 ml $\frac{N}{10}$ HNO_3 solution

Q.30 The volume of water added to 500 ml., 0.5 M NaOH so that its strength becomes 10 mg NaOH per ml:
(1) 100 ml (2) 200 ml
(3) 250 ml (4) 500 ml

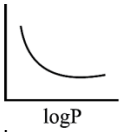
Q.31 Increasing the temperature of an aqueous solution will cause:
(1) Decrease in molality
(2) Decrease in molarity

(3) Decrease in mole fraction
(4) Decrease in % w/w

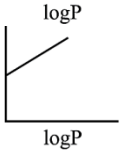
HENRY'S LAW

Q.32 Which of these curves represents Henry's Law?

(1) 

(2) 

(3) 

(4) 

Q.33 Henry's law constant for dissolution of CH_4 in benzene at 298 K is 2×10^5 mm of Hg. Then solubility of CH_4 in benzene at 298 K under 760 mm of Hg is:
(1) 1.2×10^{-5} (2) 3.8×10^{-3}
(3) 4×10^{-7} (4) 1×10^{-2}

Q.34 Which of the following gas will have most solubility in water?
(1) NH_3 (2) H_2 (3) O_2 (4) He

Q.35 Which of the gas will not follow Henry's law?
(1) HCl (2) He (3) O_2 (4) H_2

Q.36 In solubility of gas 'X' is 0.5 gL^{-1} at 1 bar then its solubility at 3 bar pressure will be:
(1) 0.5 gL^{-1} (2) 1.5 gL^{-1}
(3) 3.0 gL^{-1} (4) 2 gL^{-1}

VAPOUR PRESSURE AND RAOULT'S LAW (LIQUID-LIQUID MIXTURE)

Q.37 Two liquids X and Y form an ideal solution. At 300 K, vapour pressure of the solution containing 1 mol of X and 3 mol of Y is 550 mm Hg. At the same temperature if 1 mol of Y is further added to this solution, vapour pressure of the solution increases by 10 mm Hg. Vapour pressure (in mm Hg) of X and Y in their pure states will be respectively
(1) 200 and 300 (2) 300 and 400
(3) 400 and 600 (4) 500 and 600

Q.38 The boiling point of C_6H_6, CH_3OH, $C_6H_5NH_2$ and $C_6H_5NO_2$ are 80°C, 65°C, 184°C and 212°C respectively. Which will show highest vapour pressure at room temperature:
(1) C_6H_6 (2) CH_3OH
(3) $C_6H_5NH_2$ (4) $C_6H_5NO_2$

Q.39 At 88 °C benzene has a vapour pressure of 900 torr and toluene has a vapour pressure of 360 torr. What is the mole fraction of benzene in the mixture with toluene that will boil at 88 °C at 1 atm. pressure, benzene - toluene form an ideal-solution:
(1) 0.416 (2) 0.588 (3) 0.688 (4) 0.740

Q.40 1 mole of heptane (V. P. = 92 mm of Hg) was mixed with 4 moles of octane (V. P. = 31mm of Hg). The vapour pressure of resulting ideal solution is:
(1) 46.2 mm of Hg (2) 40.0 mm of Hg
(3) 43.2 mm of Hg (4) 38.4 mm of Hg

Q.41 If P_A^0 and P_B^0 are 108 and 36 torr respectively. What will be the mole fraction of A in vapour phase if B has mole fraction in solution 0.5?
(1) 0.25 (2) 0.75 (3) 0.60 (4) 0.35

Q.42 The vapour pressure of two pure liquids (A) and (B) are 100 and 80 torr respectively. The total pressure of the solution obtained by mixing 2 mol of (A) and 3 mol of (B) would be:
(1) 20 torr (2) 36 torr
(3) 88 torr (4) 180 torr

Q.43 The vapour pressure of ethanol and methanol are 42.0 mm and 88.5 mm Hg respectively. An ideal solution is formed at the same temperature by mixing 46.0 g of ethanol with 16.0 g of methanol. The mole fraction of methanol in the vapour is:
(1) 0.467 (2) 0.502
(3) 0.513 (4) 0.556

Q.44 What is correct relation between mole fraction in vapour phase (Y_A) of A in terms of X_A. If mole fraction in solution of A is: (X_A) (If $P_A°$ is vapour pressure of A is pure state)

(1) $(1-X_A)P_A^0$ (2) $\frac{X_A}{1-X_A}P_A^0$

(3) $\frac{1-X_A}{X_A}P_A^0$ (4) $\frac{P_A^0 X_A}{P_S}$

IDEAL AND NON-IDEAL SOLUTION

Q.45 Among the following that forms an ideal solution:
(1) water and methanol
(2) acetone and ethanol
(3) benzene and toluene
(4) water and HCl

Q.46 On mixing 10 mL of acetone with 40 ml of chloroform the total volume of the solution is:
(1) <50 ml (2) > 50 ml
(3) = 50 ml (4) cannot be predicted

Q.47 Among the following, that does not form an ideal solution is:
(1) C_6H_6 and $C_6H_5CH_3$
(2) C_2H_5Cl and C_6H_5OH
(3) C_6H_5Cl and C_6H_5Br
(4) C_2H_5Br and C_2H_5I

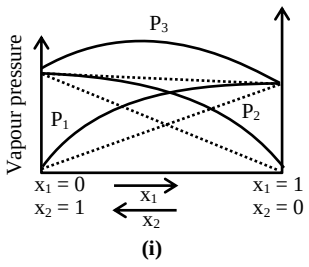
Q.48 Which condition is not satisfied by an ideal solution?
(1) ΔH mixing = 0
(2) ΔV mixing = 0
(3) ΔS mixing = 0
(4) Obeyance of Raoult's law

Q.49 A mixture of liquid showing positive deviation in Raoult's law is:
(1) $(CH_3)_2CO + C_2H_5OH$
(2) $(CH_3)_2CO + CHCl_3$
(3) $(C_2H_5)_2O + CHCl_3$
(4) $(CH_3)_2CO + C_6H_5NH_2$

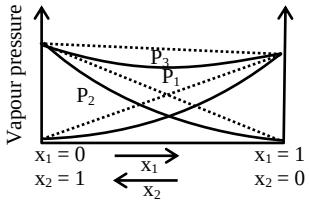
Q.50 Which of the following plots does not represent the behaviour of an ideal binary liquid solution:
(1) Plot of P_A versus X_A (mole fraction of A in liquid phase) is linear
(2) Plot of P_B versus X_B is linear
(3) Plot of p_{total} versus X_A (or X_B) is linear
(4) Plot of p_{total} versus X_A is non-linear

Q.51 For a solution of two liquids A and B, it was proved that $P = X_A (P_A^0 - P_B^0) + P_B^0$. The solution is:
(1) Ideal (2) Non-ideal
(3) Semi ideal (4) None of the above

Q.52 Study the figures given below and mark the correct statement:



(i)



(ii)

(1) (i) Nitric acid + water (ii) Acetone + ethyl alcohol
(2) (i) Water + ethyl alcohol (ii) Acetone + Benzene
(3) (i) Acetone +ethyl alcohol (ii) Acetone +chloroform
(4) (i) Benzene +chloroform (ii) Acetone + chloroform

AZEOTROPIC MIXTURE

Q.53 Azeotropic mixture are:
(1) Mixture of two solids
(2) Those which boil at different temperatures
(3) Those which can be fractionally distilled
(4) Constant boiling mixtures

Q.54 An azeotropic mixture of two liquids boil at a lower temperature than either of them when:
(1) It is saturated
(2) It does not deviate from Raoult's law
(3) It shows large negative deviation from Raoult's law
(4) It shows positive deviation from Raoult's law

Q.55 The azeotropic mixture of water (B.P 100°C) and HCl (B.P. 85°C) boils at 108.5°C. When this mixture is distilled, it is possible to obtain:
(1) Pure HCl
(2) Pure water
(3) Pure water as well as HCl
(4) Neither HCl nor H_2O in their pure states

Q.56 An azeotropic mixture of two liquids has b.p. lower than either of them when it:
(1) shows a +ve deviation from Raoult's law
(2) shows no deviation from Raoult's law
(3) shows +ve deviation from Henry's law

(4) shows -ve deviation from Henry's law

COLLIGATIVE PROPERTIES

Q.57 Which is not a colligative property?
(1) Osmotic pressure
(2) Lowering in vapour pressure
(3) Depression in freezing point
(4) Refractive index

Q.58 The lowering of vapour pressure of a solvent by addition of a non-volatile solute to it is directly proportional to:
(1) Mole fraction of non-volatile solute
(2) The nature of the solute in the solution
(3) The atmospheric pressure
(4) All

Q.59 The molal elevation constant is the ratio of the elevation in B.P. to:
(1) Molarity
(2) Molality
(3) Mole fraction of solute
(4) Mole fraction of solvent

Q.60 The vapour pressure of a solution having solid as solute and liquid as solvent is:
(1) Directly proportional to mole fraction of the solvent
(2) Inversely proportional to mole fraction of the solvent
(3) Directly proportional to mole fraction of the solute
(4) Inversely proportional to mole fraction of the solute

Q.61 Which inorganic precipitate acts as semipermeable membrane?
(1) Calcium sulphate
(2) Barium oxalate
(3) Nickel phosphate
(4) Copper ferrocyanide

Q.62 The osmotic pressure of solution increases if:
(1) Temperature is decreased
(2) Concentration is decreased
(3) Number of solute particles is increased
(4) Volume is increased

Q.63 The best colligative property used for the determination of molecular masses of polymers is:
(1) Relative lowering in vapour pressure
(2) Osmotic pressure
(3) Elevation in boiling point
(4) Depression in freezing point

Q.64 If mole fraction of the solvent in solution decreases then:
(1) Vapour pressure of solution increases
(2) B. P. decreases
(3) Osmotic pressure increases
(4) All are correct

Q.65 In osmosis phenomenon net flow of:
(1) Solvent molecules move from higher concentration to lower concentration
(2) Solvent molecules move from lower concentration to higher concentration
(3) Solvent molecules move from higher concentration to lower concentration
(4) Solute molecules move from lower concentration to higher concentration

Q.66 At constant temperature the osmotic pressure of a solution is:
(1) Directly proportional to the concentration
(2) Inversely proportional to the concentration
(3) Directly proportional to the square of concentration
(4) Directly proportional to the square root of concentration

Q.67 If a thin slice of sugar beet is placed in concentrated solution of NaCl then:
(1) Sugar beet will lose water from its cells
(2) Sugar beet will absorb water from solution
(3) Sugar beet will neither absorb nor lose water
(4) Sugar beet will dissolve in solution

Q.68 Camphor is used as solvent to determine the molecular weight of non-volatile solute by Rast method because for camphor:
(1) Molal depression constant is high
(2) Melting point is high
(3) Being cheap
(4) All

Q.69 If 0.1 M solution of glucose and 0.1 M urea solution are placed on two sides of a semipermeable membrane to equal heights, then it will be correct to say that:
(1) There will be not net movement across the membrane
(2) Glucose will flow towards urea solution
(3) Urea will flow towards glucose solution

(4) Water will flow from urea solution towards glucose solution.

Q.70 Colligative properties depend on the:
(1) Relative no. of solute molecules in sol^{n}. and the nature of the solvent
(2) Relative no. of solute molecules in solvent and the nature of solute
(3) Relative no. of solute molecules and the nature of solute and solvent
(4) Relative no. of solute molecules, irrespective of the nature of solvent and solute

Q.71 One mole of non-volatile solute is dissolved in two moles of water. The vapour pressure of the solution relative to that of water is:
(1) $\frac{2}{3}$ (2) $\frac{1}{3}$ (3) $\frac{1}{2}$ (4) $\frac{3}{2}$

Q.72 The vapour pressure of a dilute aqueous solution of Glucose is 750 mm of mercury at 373 K. The mole fraction of solute is:
(1) $\frac{1}{10}$ (2) $\frac{1}{7.6}$ (3) $\frac{1}{35}$ (4) $\frac{1}{76}$

Q.73 The vapour pressure of water at room temperature is 23.8 mm of Hg. The vapour pressure of an aqueous solution of sucrose with mole fraction 0.1 is equal to:
(1) 23.9 mm Hg (2) 24.2 mm Hg
(3) 21.42 mm Hg (4) 31.44 mm Hg

Q.74 The vapour pressure of pure A is 10 torr and at the same temperature when 1 g of B is dissolved in 20 gm of A, its vapour pressure is reduced to 9.0 torr. If the molecular mass of A is 200 amu, then the molecular mass of B is:
(1) 100 amu (2) 90 amu
(3) 75 amu (4) 120 amu

Q.75 The freezing point of a 0.05 molal solution of a non-electrolyte in water is:
(K_f = 1.86 K molality^{-1})
(1) –1.86 °C (2) –0.93 °C
(3) –0.093 °C (4) 0.093 °C

Q.76 Molal depression constant of water is 1.86 K Kg mol^{-1}. 0.02 mol of urea dissolved in 100 g of water will produce a depression in freezing point of:
(1) 0.186 °C (2) 0.372 °C
(3) 1.86 °C (4) 3.72 °C

Q.77 Elevation in boiling point was 0.52 °C when 6 g of a compound x was dissolved in 100 g of water. Molecular weight of x is:(K = 5.2 K mol^{-1} 100 g H_2O)
(1) 120 (2) 60 (3) 100 (4) 342

Q.78 Pure benzene freezes at 5.45 °C at a certain place but a 0.374 m solution of tetrachloroethane in benzene freezes at 3.55 °C. The K_f for benzene is:
(1) 5.08 K Kg mol^{-1} (2) 508 K Kg mol^{-1}
(3) 0.508 K Kg mol^{-1} (4) 50.8 °C Kg mol^{-1}

Q.79 An aqueous solution containing 1g of urea boils at 100.25 °C. The aqueous solution containing 3g of glucose in the same volume will boil at:
(1) 100.75 °C (2) 100.5 °C
(3) 100 °C (4) 100.25 °C

Q.80 An aqueous solution freezes at –0.186 °C (K_f = 1.86°; K_b = 0.512°). What is the elevation in boiling point?
(1) 0.186 (2) 0.512 (3) $\frac{0.512}{1.86}$ (4) 0.0512

Q.81 Osmotic pressure of a solution (density is 1g/ml) contain 3 g of glucose (molecular weight = 180) in 60 g of water at 15°C is:
(1) 0.34 atm (2) 0.65 atm
(3) 6.25 atm (4) 5.57 atm

Q.82 Osmotic pressure of a sugar solution at 24°C is 2.5 atmosphere. The concentration of the solution in mole per litre is:
(1) 10.25 (2) 1.025
(3) 1025 (4) 0.1025

Q.83 A solution containing 4 g of a non-volatile organic solute per 100 ml was found to have an osmotic pressure equal to 500 cm of mercury at 27°C. The molecular weight of solute is:
(1) 14.97 (2) 149.7
(3) 1697 (4) 1.497

Q.84 The osmotic pressure of blood is 7.65 atm. At 310 K. an aqueous solution of Glucose that will be isotonic with blood is .....wt/Vol:
(1) 5.41% (2) 54.1%
(3) 3.5% (4) 4.53%

Q.85 If density of 2 molal sucrose solution is 1.4 gm/ml at 25°C, find osmotic pressure?
(1) 4.06 atm (2) 2 atm
(3) 40.6 atm (4) 3.4 atm

Q.86 The vapour pressure of a solvent decreases by 10mm. of Hg when a non-volatile solute was added to the solvent. The mole fraction of the solute in the solution is 0.2. What should be the

mole fraction of the solvent if the decrease in vapour pressure is to be 20 mm. of Hg:
(1) 0.2 (2) 0.4 (3) 0.6 (4) 0.8

ABNORMAL COLLIGATIVE PROPERTY AND VAN'T HOFF FACTOR

Q.87 Equimolal solutions of A and B show depression in freezing point in the ratio of 2: 1. A remains in normal state in solution. B will be in ..... state in solution:
(1) Normal (2) Associated
(3) Hydrolysed (4) Dissociated

Q.88 Van't Hoff factor is:
(1) Less than one in case of dissociation
(2) More than one in case of association
(3) Always less than one
(4) Less than one in case of association

Q.89 The Vant Hoff factor (i) for a dilute solution of $K_3[Fe(CN)_6]$ is:
(1) 10 (2) 4 (3) 5 (4) 0.25

Q.90 The experimental molecular weight of an electrolyte will always be less than its calculated value because the value of Van't Hoff factor, 'i' is:
(1) Less than 1 (2) Greater than 1
(3) One (4) Zero

Q.91 The Vant Hoff factor (i) for a dilute aqueous solution of Glucose is:
(1) Zero (2) 1.0
(3) 1.5 (4) 2.0

Q.92 The substance A when dissolved in solvent B shows the molecular mass corresponding to A_3. The Vant Hoff's factor will be:
(1) 1 (2) 2
(3) 3 (4) $\frac{1}{3}$

Q.93 Solute A is ternary electrolyte and solute B is non-electrolyte. If 0.1 M solution of solute B produces an osmotic pressure of 2P, then 0.05M solution of A at the same temperature will produce an osmotic pressure equal to:
(1) P (2) 1.5 P (3) 2 P (4) 3 P

Q.94 The value of observed and calculated molecular weight of silver nitrate are 92.64 and 170 respectively. The degree of dissociation of silver nitrate is:
(1) 60% (2) 83.5 %
(3) 46.7% (4) 60.23%

Q.95 Which of the following solutions at the same temperature will be isotonic?
(1) 3.42 g of cane sugar in one litre water and 0.18 g of glucose in one litre water.
(2) 3.42 g of cane sugar in one litre water and 0.18 g of glucose in 0.1 litre water.
(3) 3.42 g of cane sugar in one litre water and 0.585 g of NaCl in one litre water.
(4) 3.42 g of cane sugar in one litre water and 1.17 g of NaCl in one litre water.

Q.96 The freezing point order of the solution of glucose is:
(1) 10% > 3% > 2% > 1%
(2) 1% > 2% > 3% > 10%
(3) 1% > 3% > 10% > 2%
(4) 10% > 1% > 3% > 2%

Q.97 In cold countries, ethylene glycol is added to water in the radiators of cars during winters. It results in reducing:
(1) viscosity (2) specific heat
(3) freezing point (4) boiling point

Q.98 Calculate the molal depression constant of a solvent, which has freezing point 16.6 ^oC and latent heat of fusion 180.75 Jg^{-1}:
(1) 2.68 (2) 3.86 (3) 4.68 (4) 2.86

Q.99 The osmotic pressure of a solution at 0°C is 4 atm. What will be its osmotic pressure at 546 K under similar condition?
(1) 4 atm (2) 2 atm (3) 8 atm (4) 1 atm

Q.100 The lowering of vapour pressure of 0.1 M aqueous solutions of NaCl, $CuSO_4$ and K_2SO_4 are:
(1) All equal
(2) In the ratio of 1: 1: 1.5
(3) In the ratio of 3: 2: 1
(4) In the ratio of 1.5: 1: 2.5

Q.101 The molal elevation constant of water is 0.51. The boiling point of 0.1 molal aqueous NaCl solution is nearly:
(1) 100.05°C (2) 100.1°C
(3) 100.2°C (4) 101.0°C

Q.102 A 5.8% (wt./vol.) NaCl solution will exert an osmotic pressure closest to which one of the following:
(1) 5.8% (wt./vol) sucrose solution
(2) 5.8% (wt./vol) glucose solution

(3) 2 M sucrose solution
(4) 1 M glucose solution

Q.103 Which is the correct relation between osmotic pressure of 0.1 M NaCl solution and 0.1 M Na_2SO_4 solution?
(1) The osmotic pressure of Na_2SO_4 is less than NaCl solution
(2) The osmotic pressure Na_2SO_4 is more than NaCl solution
(3) Both have same osmotic pressure
(4) None of the above

Q.104 The osmotic pressure of equimolor solutions of $BaCl_2$, NaCl, and glucose will be in the order:
(1) Glucose > NaCl > $BaCl_2$
(2) $BaCl_2$> NaCl > Glucose
(3) NaCl > $BaCl_2$> Glucose
(4) NaCl > Glucose > $BaCl_2$

Q.105 Which one of the following pairs of solutions will be expected to be isotonic under the same temperature?
(1) 0.1M urea and 0.1 M NaCl
(2) 0.1M urea and 0.2 M $MgCl_2$
(3) 0.1M NaCl and 0.1M Na_2SO_4
(4) 0.1M $Ca(NO_3)_2$ and 0.1M Na_2SO_4

Q.106 When mercuric Iodide is added to the aqueous solution of potassium iodide?
(1) The boiling point does not change
(2) Freezing point is raised
(3) The freezing point is lowered
(4) Freezing point does not change

Q.107 Which one of the following solutions will have highest osmotic pressure? (Assume that all the salts are equally dissociated)
(1) 0.1M $Al_2(SO_4)_3$
(2) 0.1M $BaCl_2$
(3) 0.1 M Na_2SO_4
(4) The solution obtained by mixing equal volumes of (2) and (3)

Q.108 The correct relationship between the boiling points of very dilute solutions of $AlCl_3(T_1)$ and $CaCl_2(T_2)$, having the same molar concentration is:
(1) $T_1 = T_2$ (2) $T_1 > T_2$
(3) $T_2 = T_1$ (4) $T_2 \geq T_1$

Q.109 Which of the following solutions will have highest boiling point?
(1) 1% Glucose in water
(2) 1% Sucrose in water
(3) 1% NaCl in water
(4) 1% Urea in water

Q.110 The freezing point of equimolal aqueous solution will be highest for:
(1) $C_6H_5NH_3Cl$ (2) $Ca(NO_3)_2$
(3) $La(NO_3)_3$ (4) $C_6H_{12}O_6$(Glucose)

Q.111 Which one has the highest boiling point:
(1) 0.1N Na_2SO_4 (2) 0.1N $MgSO_4$
(3) 0.1M $Al_2(SO_4)_3$ (4) 0.1M $BaSO_4$

Q.112 Arrange the following aqueous solutions in the order of their increasing boiling points:
(i) 10^{-4} M NaCl (ii) 10^{-4} M Urea
(iii) 10^{-3} M $MgCl_2$ (iv) 10^{-2} M NaCl
(1) (i) < (ii) < (iv) < (iii)
(2) (ii)<(i)=(iii)<(iv)
(3) (ii)<(i)<(iii)<(iv)
(4) (iv)<(iii)<(i)=(ii)

Q.113 The Van't Hoff Factor for 0.1 M $Ba(NO_3)_2$ solution is 2.74 . The degree of dissociation is:
(1) 91.3% (2) 87% (3) 100% (4) 74%

Q.114 What is the freezing point of a solution containing 8.1 gm of HBr in 100 gm. water assuming the acid to be 90% ionised:
(K_f for water = 1.86 K molality^{-1}): –
(1) 0.85°C (2) –3.53°C
(3) 0°C (4) –0.35°C

Q.115 The molar mass of NaCl determined by the osmotic pressure method will be:
(1) Higher than the theoretical value
(2) Lower than the theoretical value
(3) The same as the theoretical value
(4) None of these

Q.116 Van't Hoff Factor of Hg_2Cl_2 in its aqueous solution will be: (Hg_2Cl_2 is 80% ionized in the solution)
(1) 1.6 (2) 2.6 (3) 3.6 (4) 4.6

ANSWER KEY

TOPIC WISE QUESTIONS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	1	3	3	1	3	2	1	2	3	4	2	3	3	3	2
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	3	4	3	4	1	2	3	1	2	3	1	1	4	3	4
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	2	4	2	1	1	2	3	2	4	3	2	3	3	4	3
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	1	2	3	1	4	1	3	4	4	4	1	4	1	2	1
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	4	3	2	3	2	1	1	1	1	1	1	4	3	2	3
Que.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Ans.	2	2	1	4	4	3	4	2	2	3	3	2	4	2	2
Que.	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Ans.	2	4	4	2	2	2	3	2	3	2	2	3	2	2	4
Que.	106	107	108	109	110	111	112	113	114	115	116				
Ans.	2	1	2	3	4	3	3	2	2	2	2				