# CHEMISTRY

# BOOKS - NEET PREVIOUS YEAR (YEARWISE + CHAPTERWISE)

# SOLUTIONS

**Exercise**

**1.** Which of the following is dependent on temperature?

A. Molaity

B. Molarity

C. Mole fraction

D. Weight percentage

**Answer: B**

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**2.** If molarity of the dilute solutions is doubled ,the value of molal depression constant $(K_f)$ will be:

A. doubled

B. halved

C. tripled

D. unchanged

**Answer: D**

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**3.** At $100°C$ the vapour pressure of a solution of $6.5g$ of an solute in $100g$ water is $732mm$.If

$K_b = 0.52$, the boiling point of this solution will be :

A. $100°C$

B. $102°C$

C. $103°C$

D. $101°C$

**Answer: D**

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**4.** Which of the following statements about the composition of the vapour over an ideal $1:1$ mol mixture of benzene and toluene is correct? Assume that the temperature is constant at $25°C$. (Given: vapour pressure Date at $25°C$, benzene=12.8 kP, toluene=3.85 kPa)

A. The vapour will contain a higher percentage of toluene

B. The vapour will contain equal amounts of benzene toluene

C. Not enough information is given to make a prediction

D. The vapour will contain a higher percentage of benzene

**Answer: D**

**5.** The van't hoff factor (i) for a dilute aqueous solution of the strong electrolyte barium hydroxide is

A. 0

B. 1

C. 2

D. 3

**Answer: D**

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**6.** Which one of the following is incorrect for ideal solution?

A. $\Delta H_{mix} = 0$

B. $\Delta U_{mix} = 0$

C.

$$\Delta P = P_{obs.} - P_{\text{calculated by Raoult's law}} = 0$$

D. $\Delta G_{mix} = 0$

**Answer: D**

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**7.** A gas such as carbon monoxide would be most likely to obey the ideal gas law at

    A. high temperatures and low pressures

    B. low temperatures and high pressures

    C. high temperatures and high pressures

    D. low temperatures and low pressures

**Answer: A**

**8.** What is the fraction of the solute in a 1.00 m aqueous solution ?

A. 0.177

B. 1.770

C. 0.0354

D. 0.0177

**Answer: D**

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**9.** The boiling point of $0.2 molkg^{-1}$ solution of $X$ in water is greater than equimolal solution of $Y$ in water. Which of the following statements is true in this case?

A. X is undergoing dissociation in water.

B. Molecular mass of X is greater than the molecular mass of Y.

C. Molecular mass of X is less than the molecular mass of Y.

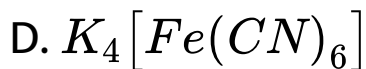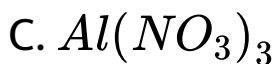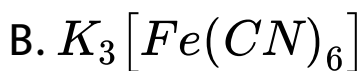D. Y is undergoing dissociation in water while X undergoes no change.

**Answer: A**

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10. Which of the following electrolytes has the same value of van't Hoff factor (i)is that of $Al_2(SO_4)_3$(if all are 100 % ionised?

A. $K_2SO_4$

B. $K_3[Fe(CN)_6]$

C. $Al(NO_3)_3$

D. $K_4[Fe(CN)_6]$

**Answer: D**

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**11.** Which one is not equal to zero for an ideal

solution?

A. $\Delta H_{mix}$

B. $\Delta S_{mix}$

C. $\Delta V_{mix}$

D. $\Delta P = P_{\text{observed}} - P_{\text{Rapult}}$

**Answer: B**

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**12.** Among the following 0.10 m aqueous solutions, which one will exhibit the largest freezing point depression?

A. KCl

B. $C_6H_{12}O_6$

C. $Al(2)(SO_4)_3$

D. $K_2SO_4$

**Answer: C**

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**13.** $P_A$ and $P_B$ are the vapour pressure of pure liquid components ,Aand B respectively of an ideal binary solution,If $x_A$ represents the

mole fraction of component A, the total pressure of the solution will be

A. $p_A + \chi_A(p_B - p_A)$

B. $p_A + \chi_A(\chi_A - p_B)$

C. $p_B + \chi_A(p_B - p_A)$

D. $p_B + \chi_A(p_A - p_B)$

**Answer: D**

**14.** The freezing point depression constant for water is $1.86° Cm^{-1}$. If $5.00g\,NaSO_4$ is dissolved in $45.0g\,H_2O$ the freezing point is changed by $-3.82°C$. Calculate the van't Hoff factor for $Na_2SO_4$.

A. $2.63$

B. $3.11$

C. $0.381$

D. $2.05$

**Answer: A**

**15.** The van't Hoff factor $i$ for a compound which undergoes dissociation in one solvent and association in other solvent is respectively.

A. less than one and less than one

B. greater than one and less than one

C. greater than one and greater than one

D. less than one and greater than one

**Answer: B**

**16.** An aqueous solution is 1.00 molal in $KI$. Which change will cause the vapor pressure of the solution to increase?

A. Addition of NaCl

B. Addition of $N_2SO_4$

C. Addition of 1.00 molal Kl

D. Addition of water

**Answer: D**

17. A solution of sucrose (molar mass $= 342gmol^{-1}$) has been prepared by dissolving 68.5 g of sucrose in 1000 g of water. The freezing point of the solution obtained will be ($K_f$ for water $= 1.86Kkgmol^{-1}$)

    A. $-0.372°C$

    B. $-0.520°C$

C. $+0.372°C$

D. $-0.570°C$

**Answer: A**

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**18.** $25.3g$ sodium carbonate, $Na_2CO_3$, was dissolved in enough water to make $250mL$ of solution. If sodium carbonate dissociates completely, molar concentration of $Na^+$ and carbonate ions are respectively:

A. 0.955 M and 1.910 M

B. 1.910 M and 0.955 M

C. 1.90 M and 1.910 M

D. 0.477 M and 0.477 M

Answer: B

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**19.** A $0.002M$ aqueous solution of an ionic compound $[Co(NH_3)_5(NO_2)]Cl$ freezes at $-0.00732°C$. Find the number of moles of

ions which 1 mole of ionic compound produces of being dissolved in water. $\left(K_f = -1.86°C/m\right)$.

A. 2

B. 3

C. 4

D. 1

**Answer: A**

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**20.** 0.5 molal aqueous solution of a weak acid (HX) is 20% ionised. If $K_f$ for water is $1.86 K kgmol^{-1}$, the lowering in freezing point of the solution is

A. $-1.12K$

B. $0.56K$

C. $1.12K$

D. $-0.56K$

Answer: C

**21.** Concentrated aqueous sulphuric acid is $98\% \ H_2SO_4$ by mass and has a density of $1.80 gmL^{-1}$. Volume of acid required to make one litre of $0.1MH_2SO_4$ solution is:

    A. $11.10mL$

    B. $16.65mL$

    C. $22.20mL$

    D. $5.55mL$

**Answer: D**

**22.** During osmosis, flow of water through a semipermeable membrane is:

   A. from solution having higher concentration only

   B. from both sides of semipermeable membrane with equal flow rates

   C. from both sides of semipermeable membrane with unequal flow rates

D. from solution having lower

concentration only

**Answer: D**

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**23.** A solution of acetone in ethnol

A. shows a negative deviation from Raoult's

law

B. shows a positive deviation from Raoult's

law

C. behaves like a near ideal solution

D. obeys Raoult's law

Answer: B

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24. $1.0g$ of a non-electrolyte solute (molar mass

$250gmol^{-1}$ was dissolved in 51.2 g of benzene.

If the freezing point depression constant of

benzene is $5.12 K kg mol^{-1}$ the lowering in freezing point will be

A. 0.4 K

B. 0.3 K

C. 0.5 K

D. 0.2 K

**Answer: A**

**25.** A solution containing $10 g per dm^3$ of urea (mol.wt. $= 60 gmol^{-1}$) is isotonic with a $5\%$ ( mass//vol.) of a non-volatile solute. The molecular mass of non-volatile solute is:

    A. $250 gmol^{-1}$

    B. $300 gmol^{-1}$

    C. $350 gmol^{-1}$

    D. $200 gmol^{-1}$

**Answer: B**

**26.** The mole fraction of the solute in one molal aqueous solution is:

A. $0.027$

B. $0.036$

C. $0.018$

D. $0.009$

**Answer: C**

**27.** A solution has $1:4$ mole ratio of pentane to hexane . The vapour pressure of pure hydrocarbons at $20°C$ are $440$ mmHgfor pentane and 120mmHg for hexane .The mole

A. 0.549

B. 0.200

C. 0.786

D. 0.478

**Answer: D**

**28.** A solution of urea (mol. Mass $60 gmol^{-1}$) boils of $100.18°C$ at one one atmospheric pressure. If $k_f$ and $K_b$ for water are $1.86$ and $0.512 K kgmol^{-1}$ respectively, the above solution will freeze at:

A. $-6.54°C$

B. $6.54°C$

C. $0.654°C$

D. $-0.654°C$

Answer: D

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**29.** The vapour pressure of two liquid P and Q are 80 torr and 60 torr respectively. The total vapour pressure obtained by mixing $3$ moles of P and 2 mole of Q would be

A. 140 torr

B. 20 torr

C. 68 torr

D. 72 torr

**Answer: D**

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**30.** formation of a solution form two components can be considered as

(i) Pure solvent rarr separated solvent molecules, $\Delta H_1$

(ii) Pure solute rarr separated solute molecules, $\Delta H_2$

(iii) separated solvent and solute molecules rarr solution, $\Delta H_3$

Solution so formed will be ideal if

A. $\Delta H_{sol.} = \Delta H_1 - \Delta H_2 - \Delta H_3$

B. $\Delta H_{sol.} = \Delta H_3 - \Delta H_1 - \Delta H_2$

C. $\Delta H_{sol.} = \Delta H_1 + \Delta H_2 + \Delta H_3$

D. $\Delta H_{sol.} = \Delta H_1 + \Delta H_2 = \Delta H_3$

**Answer: C**

31. A solution containing components A and B

follows Raoult's law, when

    A. A-B attraction force is greater than A-A

      and B-B

    B. A-B attraction force is less than A-A and

      B-B

    C. A-B attraction force remains same as A-A

      and B-B

D. volume of solution is different from sum of volumes of solute and solvent

**Answer: C**

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**32.** A solution contains non-volatile solute of molecular mass $M_2$ which of the following can be used to calculate the molecular mass of solute in terms of osmotic pressure?

($m_2$ =mass of solute,V=volume of solution,$\pi$ =osmotic pressure)

A. $M_2 = \left[\dfrac{m_2}{\pi}\right] VRT$

B. $M_2 = \left[\dfrac{m_2}{V}\right] \dfrac{RT}{\pi}$

C. $M_2 = \left[\dfrac{m_2}{V}\right] \pi RT$

D. $M_2 = \left[\dfrac{m_2}{V}\right] \dfrac{\pi}{RT}$

Answer: B

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**33.** 2.5 litre of 1 M NaOH solution are mixed with another 3 litre of 0.5 M NaOH solution Then the molarity of the resulting

A. 0.80 M

B. 1.0 M

C. 0.73 M

D. 0.50 M

Answer: C

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**34.** Pure water can be obtained from sea water by

A. centrifugation

B. plasmolysis

C. reverse osmosis

D. sedimentation

**Answer: C**

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**35.** Molarity of liquid HCl with density equal to

$1.17 g/mL$ is:

A. $36.5$

B. $18.25$

C. $32.05$

D. $42.10$

**Answer: C**

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**36.** Which of the following colligative property can provide molar mass of proteins (or polymers or colloids) with greatest precision?

A. Osmotic pressure

B. Elevation in boiling point

C. Depression in freezing point

D. Relative lowering of vapour pressure

Answer: A

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**37.** How many grams of a dibasic acid (mol. Mass 200) should be present in $100mL$ of the aqueous solution to give $0.1N$ solution.

A. 1 g

B. 2 g

C. 10 g

D. 20 g

**Answer: A**

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**38.** The vapour pressure of benzene at a certain temperature is $640 mmHg$. A non-volatile and non-electrolyte soild weighing $2.175g$ is added to $39.08g$ of benzene. If the vapour pressure of the solution is $6mmHg$. What is the molecular mass of solid substance?

    A. $49.50$

    B. $59.60$

    C. $69.40$

D. 79.82

**Answer: C**

**39.** If solution containing $0.15g$ of solute dissolved in $15g$ of solvent boils at a temperature higher by $0.216°C$ than that of pure solvent, the molecular mass of the substance is $(K_b = 2.16°C)$

A. 1.01

B. 10

C. 10.1

D. 100

**Answer: D**

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**40.** The vapour pressure of a solvent decreased by 10 mm of Hg when a non-volatile solute was added to the solvent. The mole fraction of solute in solution is 0.2, what

would be the mole fraction of solvent if the decrease in vapour pressure is 20 mm of Hg?

A. 0.8

B. 0.6

C. 0.4

D. 0.2

Answer: B

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**41.** A $5\%$ solution of cane sugar (molecular weight =342) is isotonic with a $1\%$ solution of substance $X$. The molecular weight of $X$ is

A. 34.2

B. 171.2

C. 68.4

D. 136.8

**Answer: C**

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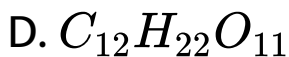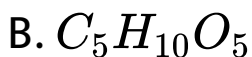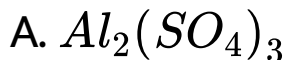**42.** The volume strength of $1 \cdot 5$ N $H_2O_2$ solution is

A. 4.8

B. 5.2

C. 8.4

D. 8.8

**Answer: C**

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**43.** Which of the following $0.10M$ aqueous solution will have the lowest freezing point?

A. $Al_2(SO_4)_3$

B. $C_5H_{10}O_5$

C. KI

D. $C_{12}H_{22}O_{11}$

Answer: A

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**44.** The vapour pressure at a given temperature of an ideal solution containing $0.2mol$ of non-volatile solute and $0.8mol$ of a solvent is $60mm$ of $Hg$. The vapour pressure of the pure solvent at the same temperature will be

    A. 150 mm of Hg

    B. 60 mm of Hg

    C. 75 mm of Hg

    D. 120 mm of Hg

**Answer: C**

**45.** Vapour pressure of benzene at $30°C$ is 121.8 mm. When 15 g of a non-volatile solute is dissolved in 250 g of benzene its vapour pressure decreased to 120.2 mm. The molecular weight of the solute is (mol. Weight of solvent = 78)

A. 356.2

B. 456.8

C. 530.1

D. 656.7

**Answer: A**

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**46.** According to Raoult's law, relative lowering of vapour pressure of a solvent is equal to

A. moles of solute

B. moles of solvent

C. mole fraction of solute

D. mole fraction of solvent

**Answer: C**

**47.** Which of the following modes of expressing concentration is not independent of temperature?

(I) Normality

(II) Formality

(III) Molarity

A. Molarity

B. Molality
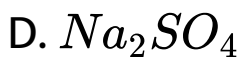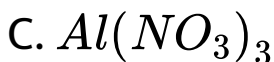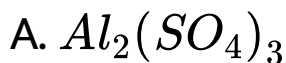
C. Formality

D. Normality

**Answer: B**

**48.** Which one of the following salts will have the same value of van't hoff factor (i) as that of $K_4\left[Fe(CN)_6\right]$?

A. $Al_2(SO_4)_3$

B. NaCl

C. $Al(NO_3)_3$

D. $Na_2SO_4$

**Answer: A**

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**49.** In a pair of immiscible liquid, a common solute dissolves in both and the equilibrium is reached. Then, the concentration of the solute in upper layer is

    A. in fixed ratio with that in the lower layer

    B. same as the lower layer

    C. lower than the lower layer

    D. higher than the lower layer

**Answer: A**

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**50.** At $25°C$ the highest osmotic pressure is exhibited by $0.1M$ solution of

A. $CaCl_2$

B. KCl

C. glucose

D. urea

Answer: A

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**51.** Which one is a colligative property

    A. Boiling point

    B. Vapour pressure

    C. Osmotic pressure

    D. Freezing point

**Answer: C**

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**52.** Blood cells retain their normal shape in solution which are

A. hypotonic to blood

B. isotonic to blood

C. hypertonic to blood

D. equinormal to blood

Answer: B

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**53.** Which aqueous solution has minimum freezing point?

A. 0.01 m NaCl

B. $0.005mMhgl_2$

C. $0.005mC_2H_5OH$

D. $0.005mMgSO_4$

**Answer: A**

**54.** The relative lowering of vapour pressure is equal to the ratio between the number of

    A. solute molecules to the solvent molecules

    B. solute molecules to the total molecules in solution

    C. solvent molecules to the total molecules in the solution

D. solvent molecules to the total number of

ions of the solute

**Answer: B**

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**55.** All form ideal solution except

A. $C_6H_6$ and $C_6H_5CH_3$

B. $C_2H_5Cl$ and $C_2H_5l$

C. $C_6H_5Cl$ and $C_6H_5Br$

D. $C_2H_5l$ and $C_2H_5OH$

**Answer: D**

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**56.** An ideal solution is formed when its

components same

    A. have no volume change on mixing

    B. have no enthalpy change on mixing

    C. have both the above characteristics

D. have high solublity

**Answer: C**

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