

NEET : CHAPTER WISE TEST-1

SUBJECT :- CHEMISTRY

CLASS :- 12th

CHAPTER :- SOLUTION

DATE.....

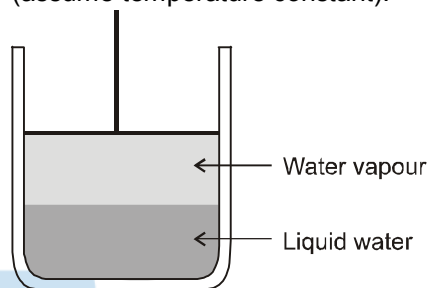
NAME.....

SECTION.....

(SECTION-A)

1. A solution of sulphuric acid in water exhibits :
 (A) Negative deviations from Raoult's law
 (B) Positive deviations from Raoult's law
 (C) Ideal properties
 (D) The applicability of Henry's law
2. 8 g NaOH is dissolved in one litre of solution, its molarity is :
 (A) 0.8 M (B) 0.4 M
 (C) 0.2 M (D) 0.1 M
3. 15 gram of methyl alcohol is dissolved in 35 gram of water. What is the mass percentage of methyl alcohol in solution ?
 (A) 30% (B) 50%
 (C) 70% (D) 75%
4. Mole fraction of ethanol in ethanol water mixture is 0.25. Hence percentage concentration of ethanol by weight of mixture is :
 (A) 25% (B) 75%
 (C) 46% (D) 54%
5. A 5.2 molal aqueous solution of CH₃OH is supplied. What is the mole fraction of methyl alcohol in the solution ?
 (A) 0.050 (B) 0.100
 (C) 0.190 (D) 0.086
6. A liquid is kept in a closed vessel. If a glass plate (negligible mass) with a small hole is kept on top of the liquid surface, then the vapour pressure of the liquid in the vessel is :
 (A) More than what would be if the glass plate were removed
 (B) Same as what would be if the glass plate were removed
 (C) Less than what would be if the glass plate were removed
 (D) Cannot be predicted
7. The vapour pressure of water depends upon :
 (A) Surface area of container
 (B) Volume of container
 (C) Temperature
 (D) All

8. Among the following substances, the lowest vapour pressure is exerted by :
 (A) Water (B) Mercury
 (C) Acetone (D) Ethanol
9. The vapour pressure of water at 20°C is 17.54 mmHg. What will be the vapour pressure of the water in the apparatus shown after the piston is lowered, decreasing the volume of the gas above the liquid to one half of its initial volume (assume temperature constant).



- (A) 8.77 mmHg
 (B) 17.54 mmHg
 (C) 35.08 mmHg
 (D) between 8.77 and 17.54 mmHg
10. Colligative properties of the solution depend upon
 (A) Nature of the solution
 (B) Nature of the solute
 (C) Concentration of solute particles
 (D) Both (B) and (C)
11. Van't Hoff factor is :
 (A) Less than one in case of dissociation
 (B) More than one in case of association
 (C) Always less than one
 (D) Less than one in case of association
12. The experimental molecular weight of an electrolyte will always be less than its calculated value because the value of vant Hoff factor, 'i' is :
 (A) Less than 1 (B) Greater than 1
 (C) One (D) Zero
13. One mole of a solute A is dissolved in a given volume of solvent. The association of the solute take place as follows:

$$nA \rightleftharpoons A_n$$
 If α is the degree of association of A, the van't Hoff factor i is expressed as:
 (A) $i = 1 - \alpha$ (B) $i = 1 + \frac{\alpha}{n}$
 (C) $i = \frac{1 - \alpha + \frac{\alpha}{n}}{1}$ (D) $i = 1$

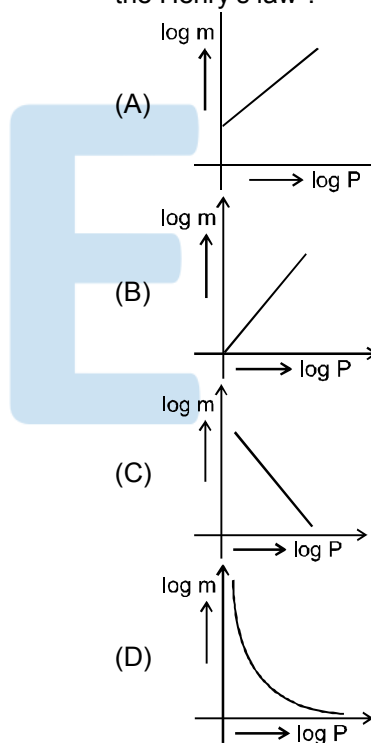
14. Which of the following salt has the same value of Vont Hoff's factor as that of $K_3[Fe(CN)_6]$
 (A) $Al_2(SO_4)_3$ (B) NaCl
 (C) $Al(NO_3)_3$ (D) Na_2SO_4
15. The mass of glucose that should be dissolved in 100 g of water in order to produce same lowering of vapour pressure as is produced by dissolving 1 g of urea (mol. mass =60) in 50 g of water is :
 (A) 1 g (B) 2 g
 (C) 6 g (D) 12 g
16. Relative decrease in vapour pressure of an aqueous NaCl is 0.167. Number of moles of NaCl present in 180g of H_2O is :
 (A) 2 mol (B) 1 mol
 (C) 3 mol (D) 4 mol
17. An aqueous solution is 1.00 molal in KI. Which change will cause the vapour pressure of the solution to increase ?
 (A) Addition of NaCl
 (B) Addition of Na_2SO_4
 (C) Addition of 1.00 molal KI
 (D) Addition of water
18. The vapour pressure of pure benzene, C_6H_6 at $50^\circ C$ is 268 Torr. How many moles of non-volatile solute per mol of benzene is required to prepare a solution of benzene having a vapour pressure of 167 Torr at $50^\circ C$?
 (A) 0.377 (B) 0.605
 (C) 0.623 (D) 0.395
19. The vapour pressure of water at room temperature is lowered by 5% by dissolving a solute in it, then the approximate molality of solution is :
 (A) 2 (B) 1 (C) 4 (D) 3
20. The best colligative property used for the determination of molecular masses of polymers is :
 (A) Relative lowering in vapour pressure
 (B) Osmotic pressure
 (C) Elevation in boiling point
 (D) depression in freezing point
21. A solution containing 4g of polyvinyl chloride in 1 litre of dioxane was found to have an osmotic pressure of 6×10^{-4} atm at 300K . The molecular mass of polymer is :
 (A) 3×10^3 (B) 1.6×10^5
 (C) 5×10^4 (D) 6.4×10^2
22. Which has maximum osmotic pressure at temperature T :
 (A) 100 mL of 1 M urea solution
 (B) 300 mL of 1 M glucose solution
 (C) mixture of 100 mL of 1 M urea solution and 300 mL of 1 M glucose solution
 (D) all are isotonic
23. A solution of a substance containing 1.05 g per 100 mL. was found to be isotonic with 3%(w/v) glucose solution. The molecular mass of the substance is :
 (A) 31.5 (B) 6.3 (C) 630 (D) 63
24. Aluminium phosphate is 100% ionised in 0.01 molal aqueous solution. Hence, $\Delta T_b / K_b$ is :
 (A) 0.01 (B) 0.015
 (C) 0.0175 (D) 0.02
25. Which has the highest boiling point ?
 (A) 0.1 M Na_2SO_4
 (B) 0.1 M $C_6H_{12}O_6$ (glucose)
 (C) 0.1 M $MgCl_2$
 (D) 0.1 M $Al(NO_3)_3$
26. 1.0 molal aqueous solution of an electrolyte X_3Y_2 is 25% ionized. The boiling point of the solution is (K_b for $H_2O = 0.52 K \text{ kg/mol}$)
 (A) 375.5 K (B) 374.04 K
 (C) 377.12 K (D) 373.25 K
27. A complex of iron and cyanide ions is 100% ionised at 1m (molal). If its elevation in boiling point is 2.08K. ($K_b = 0.52K \text{ mol}^{-1} \text{ kg}$), then the complex is :
 (A) $K_3[Fe(CN)_6]$ (B) $Fe(CN)_2$
 (C) $K_4[Fe(CN)_6]$ (D) $Fe(CN)_4$
28. Which of the following has been arranged in order of decreasing freezing point?
 (A) 0.05 M $KNO_3 > 0.04 M CaCl_2 > 0.140 M$ sugar $> 0.075 M CuSO_4$
 (B) 0.04 M $BaCl_2 > 0.140 M$ sucrose $> 0.075 M CuSO_4 > 0.05 M KNO_3$
 (C) 0.075 M $CuSO_4 > 0.140 M$ sucrose $> 0.04 M BaCl_2 > 0.05 M KNO_3$
 (D) 0.075 M $CuSO_4 > 0.05 M NaNO_3 > 0.140 M$ sucrose $> 0.04 M BaCl_2$
29. 50 g of antifreeze (ethylene glycol) is added to 200 g water. What amount of ice will separate out at $-9.3^\circ C$? ($K_f = 1.86K \text{ kg mol}^{-1}$)
 (A) 45 mg (B) 42 g
 (C) 38.71 g (D) 38.71 mg

30. If Raoult's law is obeyed, the vapour pressure of the solvent in a solution is directly proportional to
 (A) Mole fraction of the solvent
 (B) Mole fraction of the solute
 (C) Mole fraction of the solvent and solute
 (D) The volume of the solution
31. Which statement about the composition of vapour over an ideal 1 : 1 molar mixture of benzene and toluene is correct ? Assume the temperature is constant at 25°C.
Vapour pressure data (25°C) :
 Benzene 75 mm Hg
 Toluene 22 mm Hg
 (A) The vapour will contain higher percentage of benzene
 (B) The vapour will contain higher percentage of toluene
 (C) The vapour will contain equal amount of benzene and toluene
 (D) Not enough information is given to make a prediction
32. Which of the following shows negative deviation from Raoult's law ?
 (A) CHCl_3 and acetone
 (B) CHCl_3 and $\text{C}_2\text{H}_5\text{OH}$
 (C) $\text{C}_6\text{H}_5\text{CH}_3$ and C_6H_6
 (D) C_6H_6 and CCl_4
33. Which of the following solution containing components A and B follows Raoult's law :
 (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 volume of solute and solvent
34. A maxima or minima obtained in the temperature composition curve of a mixture of two liquids indicates
 (A) an azeotropic mixture
 (B) a critical point formation
 (C) that the liquids are immiscible with one another
 (D) that the liquids are partially miscible at the maximum or minimum
35. When KCl dissolves in water (assume endothermic dissolution), then :
 (A) $\Delta H = +ve$, $\Delta S = +ve$, $\Delta G = +ve$
 (B) $\Delta H = +ve$, $\Delta S = -ve$, $\Delta G = -ve$
 (C) $\Delta H = +ve$, $\Delta S = +ve$, $\Delta G = -ve$
 (D) $\Delta H = -ve$, $\Delta S = -ve$, $\Delta G = +ve$

(SECTION-B)

36. An azeotropic mixture of two liquids boil at a lower temperature than either of them when
 (A) It is saturated
 (B) It does not deviate from Raoult's law
 (C) It shows negative deviation from Raoult's law
 (D) It show positive deviation from Raoult's law
37. The solubility of gases in liquids :
 (A) increases with increase in pressure and temperature
 (B) decreases with increase in pressure and temperature
 (C) Increases with increase in pressure and decrease in temperature
 (D) decreases with increase in pressure and increase in temperature

38. Which of the following curves represents the Henry's law ?

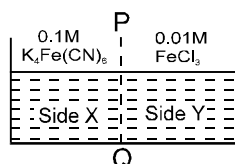


39. The solubility of $\text{N}_2(\text{g})$ in water exposed to the atmosphere, when its partial pressure is 593 mm is 5.3×10^{-4} M. Its solubility at 760 mm and at the same temperature is :
 (A) 4.1×10^{-4} M
 (B) 6.8×10^{-4} M
 (C) 1500 M
 (D) 2400 M
40. Pressure cooker reduces cooking time because
 (A) the heat is more evenly distributed inside the cooker
 (B) a large flame is used
 (C) boiling point of water is elevated
 (D) whole matter is converted into steam

41. Mixture of volatile components A and B has total vapour pressure (in Torr) $p = 254 - 119 x_A$ where x_A is mole fraction of A in mixture. Hence p_A^0 and p_B^0 are (in Torr)

- (A) 254, 119 (B) 119, 254
(C) 135, 254 (D) 119, 373

42. FeCl_3 on reaction with $\text{K}_4[\text{Fe}(\text{CN})_6]$ in aq. solution gives blue colour. These are separated by a semipermeable membrane PQ as shown. Due to osmosis there is-



- (A) blue colour formation in side X
(B) blue colour formation in side Y
(C) blue colour formation in both of the sides X and Y
(D) no blue colour formation

43. The osmotic pressure of equimolar solutions of BaCl_2 , NaCl and glucose will be in the order

- (A) glucose > NaCl > BaCl_2
(B) BaCl_2 > NaCl > glucose
(C) NaCl > BaCl_2 > glucose
(D) NaCl > glucose > BaCl_2

44. Which of the following is not correct for an ideal solution ?

- (A) $P_A = P_A^0 X_A$ (B) $\Delta H_{\text{mix}} = 0$
(C) $\Delta V_{\text{mix}} = 0$ (D) $\Delta S_{\text{mix}} = 0$

45. A solution of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) is isotonic with 4 g of urea ($\text{NH}_2\text{CO-NH}_2$) per liter of solution. The concentration of glucose is :

- (A) 4 g/l (B) 8 g/l
(C) 12 g/l (D) 14 g/l

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

- (A) 2.05 (B) 2.63
(C) 3.11 (D) 0.381

47. P_A and P_B are the vapour pressure of pure liquid components, A and 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) $P_A + X_A (P_B - P_A)$
(B) $P_A + X_A (P_A - P_B)$
(C) $P_B + X_A (P_B - P_A)$
(D) $P_B + X_A (P_A - P_B)$

48. The boiling point of 0.2 mol kg^{-1} solution of X in water is greater than equimolar solution of Y in water. Which one of the following statements is true in this case ?

- (A) Molecular mass of X is greater than the molecular mass of Y.
(B) Molecular mass of X is less than the molecular mass of Y.
(C) Y is undergoing dissociation in water while X undergoes no change.
(D) X is undergoing dissociation in water.

49. If molality of the dilute solution is doubled, the value of molal depression constant (K_f) will be :

- (A) doubled (B) halved
(C) tripled (D) unchanged

50. The mixture that forms maximum boiling azeotrope is :

- (A) Heptane + Octane
(B) Water + Nitric acid
(C) Ethanol + Water
(D) Acetone + Carbon disulphide