



**PARISHRAM PUBLICATIONS  
PUNE**

**NAME of Students :-** \_\_\_\_\_

**Chemistry :- Solution**

**Class : XII**

**Total Marks :-**

1. In calculating osmotic pressure the concentration of solute is expressed in

- a. molarity                      b. molality  
c. mole fraction                d. mass percent

2. Ebullioscopic constant is the boiling point elevation when the concentration of solution is

- a. 1m                                b. 1M  
c. 1 mass%                        d. 1 mole fraction of solute.

3. The colligative properties of a solution depends upon-

- a. The number of solute particles present in it  
b. The chemical nature of solute present in it  
c. The nature of solvent used  
d. None

4. If  $P^\circ$  and  $P_s$  are vapour pressure of solvent and its solution respectively,  $x_1$  and  $x_2$  be mole fraction of solute and solvent respectively, then,

- a.  $P_s = P^\circ/x_2$                       b.  $P^\circ - P_s = P^\circ x_2$   
c.  $P_s = P^\circ x_2$                       d.  $\frac{P_1^\circ - P_1}{P_1^\circ} = x_2$

5. Which is not a colligative property?

- a. Lowering of vapour pressure  
b. Freezing point  
c. Osmotic pressure  
d. Elevation in boiling point

6. The boiling point of a solvent containing a dissolved solid substance:

- a. is depressed                      b. is elevated  
c. does not change                d. none of the above

7. A perfectly semipermeable membrane when used to separate a solution from its solvent permits through it a passage of

- a. Solute only                        b. Solvent only  
c. Both a and b                      d. None of these

8. The osmotic pressure of a solution increases if

- a. Temperature is lowered  
b. Volume is increased  
c. Number of solute molecules is increased  
d. None of these

9. A liquid possessing which of the following characteristics will be most suitable to determine the

molecular mass of a compound by cryoscopic measurements.

- a. That having low freezing point and small enthalpy of freezing  
b. That having high freezing point and low enthalpy of freezing  
c. Greater than the normal boiling point of either of the liquid  
d. Smaller than the normal boiling point of either of the liquid

10. Cryoscopic constant is also known as

- a. molal elevation constant  
b. molar depression constant  
c. ebullioscopic constant  
d. none

11. The molal freezing point constant of water is 1.86 K  $m^{-1}$ . If 342 g of cane sugar is dissolved in 1000 g of water, the solution will freeze at

- a.  $-1.86^\circ C$                               b.  $1.86^\circ C$   
c.  $-3.92^\circ C$                               d.  $2.42^\circ C$

12. Arrange

- (i)  $NaNO_3$                               (ii)  $BaCl_2$   
(iii)  $K_3[Fe(CN)_6]$                       (iv)  $C_6H_{12}O_6$

In increasing order of van'thoff factor

- a.  $iv < ii < i < iii$                       b.  $iv > i > ii > iii$   
c.  $iv < iii < ii < i$                       d.  $iv < i < ii < iii$

13. The osmotic pressure of equimolar solutions of  $BaCl_2$ ,  $NaCl$  and glucose follow the order

- a.  $BaCl_2 > NaCl > glucose$   
b.  $BaCl_2 < NaCl < glucose$   
c.  $NaCl > BaCl_2 > glucose$   
d.  $NaCl > glucose > BaCl_2$

14. Which solution will show maximum elevation in boiling point?

- a. 0.1 M  $KCl$                               b. 0.1 M  $BaCl_2$   
c. 0.1 M  $FeCl_3$                               d. 0.1 M  $Fe_2(SO_4)_3$

15. Pure benzene freezes at  $5.3^\circ C$ . A solution of 0.223g of phenylacetic acid ( $C_6H_5CH_2COOH$ ) in 4.4g of benzene ( $K_f = 5.12 K kg mol^{-1}$ ) freezes at  $4.47^\circ C$ . From this observation, one can conclude that

- a. Phenylacetic acid exists as such in benzene  
b. Phenylacetic acid undergoes partial ionization in benzene

- c. Phenylacetic acid undergoes complete ionization in benzene  
 d. Phenylacetic acid dimerizes in benzene
16. If a thin slice sugar beet is placed in concentrated solution of NaCl, then,  
 a. Sugar beet will loose water from its cells  
 b. Sugar beet will absorb water from solution  
 c. Sugar beet will neither loose nor absorb water  
 d. Sugar beet will dissolve in solution
17. 0.1M NaCl and 0.05 M BaCl<sub>2</sub> solutions are separated by a semi-permeable membrane in a container. For this system, choose the correct answer  
 a. There is no movement of any solution across the membrane  
 b. Water flows from BaCl<sub>2</sub> solution towards NaCl solution  
 c. Water flows from NaCl solution towards BaCl<sub>2</sub> solution  
 d. Osmotic pressure of 0.1M NaCl is lower than the osmotic pressure of BaCl<sub>2</sub> (Assume complete dissociation)
18. The excess pressure that is applied to the solution to prevent the passage of solvent into it through a semipermeable membrane is referred to as:  
 a. critical solution pressure  
 b. normal pressure of the solvent  
 c. osmotic pressure of the solution  
 d. none of these
19. Isotonic solution are those which have  
 a. Same osmotic pressure  
 b. Same molarity  
 c. Same density  
 d. Same normality
20. A living cell contains a solution which is isotonic with 0.3 M sugar solution. What osmotic pressure develops when the cell is placed in 0.1 M KCl solution at body temperature?  
 a. 5.08 atm                      b. 2.54 atm  
 c. 4.92 atm                      d. 2.46 atm
21. The osmotic pressure of blood is 7.65 atm at 310 K. An aqueous solution of glucose isotonic with blood has the percentage (by volume)  
 a. 5.41 %                      b. 3.54 %  
 c. 4.53 %                      d. 53.4 %
22. Identify the correct statement  
 a. vapour pressure of solution is higher than that of pure solvent.  
 b. boiling point of solvent is lower than that of solution  
 c. osmotic pressure of solution is lower than that of solvent  
 d. osmosis is a colligative property.
23. Vapour pressure of a solution is

- a. directly proportional to the mole fraction of the solute  
 b. inversely proportional to the mole fraction of the solute  
 c. inversely proportional to the mole fraction of the solvent  
 d. directly proportional to the mole fraction of the solvent
24. Which condition is not satisfied by ideal solution?  
 a.  $\Delta_{(mix)}H = 0$   
 b.  $\Delta_{(mix)}V = 0$   
 c.  $\Delta_{(mix)}S = 0$   
 d. Obedience of Raoult's law
25. Each pair forms ideal solution except  
 a. C<sub>2</sub>H<sub>5</sub>Br and C<sub>2</sub>H<sub>5</sub>I  
 b. C<sub>6</sub>H<sub>5</sub>Cl and C<sub>6</sub>H<sub>5</sub>Cl  
 c. C<sub>6</sub>H<sub>6</sub> and C<sub>6</sub>H<sub>5</sub>CH<sub>3</sub>  
 d. C<sub>2</sub>H<sub>5</sub>I and C<sub>2</sub>H<sub>5</sub>OH
26. Which solution will have highest boiling point?  
 a. 1% glucose in water  
 b. 1% sucrose in water  
 c. 1% NaCl in water  
 d. 1% CaCl<sub>2</sub> in water
27. Negative deviation from Raoult's law is observed in which one of the following binary liquid mixtures?  
 a. ethanol and acetone  
 b. benzene and toluene  
 c. acetone and chloroform  
 d. chloroethane and bromoethane
28. What is the unit of Henry's law constant?  
 a. mol L bar<sup>-1</sup>                      b. mol L<sup>-1</sup> bar<sup>-1</sup>  
 c. mol L bar                      d. L bar mol<sup>-1</sup>
29. Which of the following statement is NOT correct for 0.1 M urea solution and 0.05 M sucrose solution?  
 a. osmotic pressure exhibited by urea solution is higher than that exhibited by sucrose solution  
 b. urea solution is hypertonic to sucrose solution  
 c. they are isotonic solutions  
 d. sucrose solution is hypotonic to urea solution
30. An aqueous solution of methanol in water has vapour pressure  
 a. Equal to that of water  
 b. Equal to that of methanol  
 c. More than that of water  
 d. Less than that of water
31. Two liquids X and Y form an ideal solution. The mixture has a vapour pressure of 400 mm at 300 K when mixed in the molar ratio of 1 : 1 and a vapour pressure of 350 mm when mixed in the molar ratio of 1 : 2 at the same temperature. The vapour pressures of the two pure liquids X and Y respectively are  
 a. 250 mm, 550 mm  
 b. 350 mm, 450 mm

- c. 350 mm, 700 mm  
d. 550 mm, 250 mm

32. The glucose solution to be injected into the blood stream and the blood itself should have the same

- a. Molarity                      b. Vapour pressure  
c. Osmotic pressure          d. Viscosity

33. The use of common salts, e.g., NaCl or CaCl<sub>2</sub> anhydrous, is made to clear snow on the roads. This causes:

- a. A lowering of freezing point of water  
b. A lowering of melting point of ice  
c. Ice melts at the temperature of atmosphere present at that time  
d. All the above

34. The freezing point of a 0.05 molal solution of non-electrolyte in water is ( $K_f = 1.86 \text{ K m}^{-1}$ )

- a.  $-1.86^\circ\text{C}$                       b.  $-0.93^\circ\text{C}$   
c.  $-0.093^\circ\text{C}$                      d.  $0.093^\circ\text{C}$

35. The depression in freezing point for 1 M urea, 1 M glucose and 1 M NaCl are in the ratio

- a. 1 : 2 : 3                        b. 3 : 2 : 2  
c. 1 : 1 : 2                        d. None of these

36. The factor  $\Delta T_f / K_f$  represents

- a. molarity                        b. formality  
c. normality                       d. molality

37. The vapour pressure of a solution containing 2 moles of a solute in 2 moles of water (vapour pressure of pure water = 24 mm Hg) is

- a. 24 mm Hg                      b. 32 mm Hg  
c. 48 mm Hg                      d. 12 mm Hg

38. The colligative property of a solution is

- a. vapour pressure                b. boiling point  
c. osmotic pressure                d. freezing point

39. Cryoscopic constant depends on

- a. nature of solvent                b. nature of solute  
c. nature of solution                d. number of solvent molecules

40. Pressure cooker reduces cooking time for food because

- a. boiling point of water involved in cooking is increased  
b. heat is more evenly distributed in the cooking space  
c. the higher pressure inside the cooker crushes the food material  
d. cooking involves chemical changes helped by a rise in temperature.

41. Which of the following 0.1M aqueous solution will have the lowest freezing point?

- a. C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>                        b. C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>  
c. Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>                        d. KI

42. The freezing point of water is depressed by  $0.37^\circ\text{C}$  in a 0.01 molal NaCl solution. The freezing point of 0.02 molal solution of urea is depressed by

- a.  $0.37^\circ\text{C}$                         b.  $0.74^\circ\text{C}$   
c.  $0.185^\circ\text{C}$                         d.  $0^\circ\text{C}$

43. The freezing point of 1% aqueous solution of calcium nitrate will be

- a.  $0^\circ\text{C}$                               b. above  $0^\circ\text{C}$   
c.  $1^\circ\text{C}$                               d. below  $0^\circ\text{C}$

44. Henry's law constant for a gas CH<sub>3</sub>Br is 0.159 mol dm<sup>-3</sup> atm at 25 °C. What is the solubility of CH<sub>3</sub>Br in water at 25 °C and a partial pressure of 0.164 atm?

- a. 0.0159 mol L<sup>-1</sup>                b. 0.164 mol L<sup>-1</sup>  
c. 0.026 M                        d. 0.042 M

45. For a solution of nonelectrolyte in water, the van'thoff factor is

- a. always equal to 0                b. less than or equal to 1  
c. always equal to 1                d.  $> 1$  but  $< 2$

46. The van't Hoff factor of benzoic acid solution in benzene is 0.5. In this solution, benzoic acid

- a. dissociates                        b. forms dimer  
c. remains unchanged                d. forms tetramer

47. Pure water can be obtained from sea water by

- a. centrifugation                    b. plasmolysis  
c. reverse osmosis                    d. sedimentation

48. What is the mass of the precipitate formed when 50 mL of 16.9% (W/V) solution of AgNO<sub>3</sub> is mixed with 50 mL of 5.8% (W/V) NaCl solution ?

- (Ag = 107.3, N = 14, O = 16, Na = 23, Cl = 35.5)  
a. 7 g                                b. 14 g  
c. 28 g                                d. 3.5 g

49. At 100°C, the vapour pressure of a solution of 6.5 g of a solute in 100 g water is 732 mm. If  $K_b = 0.52$ , the boiling point of this solution will be

- a.  $102^\circ\text{C}$                         b.  $103^\circ\text{C}$   
c.  $101^\circ\text{C}$                         d.  $100^\circ\text{C}$

50. The relation between solubility of a gas in liquid at constant temperature and external pressure is stated by which law ?

- a. Raoult's law  
b. van't Hoff Boyle's law  
c. van't Hoff Charles' law  
d. Henry's law