CBSE

SOLUTIONS WS 1

Class 12 - Chemistry

1. When blood cells are placed in pure water, blood cells **[1]**

   a) Become white in colour
   b) Shrinks
   c) Diffuses in water
   d) Swells up

2. Which of the following units is useful in relating the concentration of a solution with its vapour pressure? **[1]**

   a) mole fraction
   b) parts per million
   c) mass percentage
   d) molality

3. If molality of aqueous solution of H_2SO_4 is 2, then normality of solution whose density is 1.2 g/mL is **[1]**

   a) 8.02
   b) 4.01
   c) 9.01
   d) 2.02

4. The boiling point of a solvent containing a non-volatile solute: **[1]**

   a) is disconsolate
   b) does not change
   c) is elevated
   d) is depressed

5. In pressure cooker boiling point of water **[1]**

   a) Sometimes increases and sometimes decreases
   b) Decreases
   c) Remain constant
   d) Increases

6. Which one of the following pairs will **not** form an ideal solution? **[1]**

   a) Hexane and Heptane
   b) Nitric acid and Water
   c) Ethyl chloride and Ethyl bromide
   d) Benzene and Toluene

7. Out of the following 1.0 M aqueous solutions, which one will show largest freezing point depression? **[1]**

   a) $C_6H_{12}O_6$
   b) $Al_2(SO_4)_3$
   c) NaCl
   d) Na_2SO_4

8. A compound undergoes complete tetramerization in a given organic solvent. The Van't Hoff factor **i** is: **[1]**

   a) 4
   b) 2
   c) 0.25
   d) 0.5

9. Colligative properties depend on _____. **[1]**

   a) the nature of the solute particles dissolved in solution.
   b) the nature of solvent particles.
   c) the number of solute particles in solution.
   d) the physical properties of the solute

particles dissolved in solution.

10. A beaker contains a solution of a substance 'A'. Precipitation of substance 'A' takes place when a small amount of 'A' is added to the solution. The solution is _____. **[1]**

a) supersaturated
b) unsaturated
c) concentrated
d) saturated

11. The use of pressure cooker reduces cooking time because it creates **[1]**

a) High pressure
b) Low pressure
c) Low temperature
d) High temperature

12. A solution showing a large positive deviation from ideal behaviour has **[1]**

a) ΔH_{mix} is positive
b) Lower boiling point than both the components and ΔH_{mix} is negative
c) Higher boiling point than both the components
d) ΔH_{mix} is Negative

13. K_H value for Ar(g), CO_2 (g), HCHO (g) and CH_4 (g) are 40.39, 1.67, 1.83×10^{-5} and 0.413 respectively. Arrange these gases in the order of their increasing solubility. **[1]**

a) $Ar < CH_4 < CO_2 < HCHO$
b) $HCHO < CO_2 < CH_4 < Ar$
c) $Ar < CO_2 < CH_4 < HCHO$
d) $HCHO < CH_4 < CO_2 < Ar$

14. A colligative property is: **[1]**

a) boiling point
b) vapour pressure
c) electrical conductivity
d) osmotic pressure

15. At equilibrium, the rate of dissolution of a solid solute in a volatile liquid solvent is _____. **[1]**

a) greater than the rate of crystallisation
b) less than the rate of crystallisation
c) zero
d) equal to the rate of crystallisation

16. Which of the following is **not** true about enantiomers? **[1]**

a) They have the same specific rotation.
b) They have the same chemical reactivity.
c) They have the same density.
d) They have the same melting or boiling point.

17. Which among the following show positive deviation? **[1]**

a) Chloroform and benzene
b) Acetone and aniline
c) Hydrochloric acid and water
d) Acetone and ethanol

18. Which of the following has highest boiling point? **[1]**

a) 0.1 molal urea solution
b) 0.1 molal NaCl solution
c) 0.1 molal $BaCl_2$ solution
d) 0.1 molal sugar solution

19. Which has highest freezing point at 1 atm? **[1]**

a) 0.1 molal sugar solution
b) 0.1 molal $BaCl_2$ solution

c) 0.1 molal NaCl solution

d) 0.1 molal $FeCl_3$ solution

20. Solution of hydrogen in palladium is an example of **[1]**

a) Gas in gas

b) Solid in solid

c) Liquid in gas

d) Gas in solid

21. In which unit, the concentration of solution remains independent of temperature **[1]**

a) formality

b) normaility

c) molality

d) molarity

22. Which of the following formula represents Raoult's law for a solution containing non-volatile solute? **[1]**

a) $p_{\text{solute}} = p^0_{\text{solute}} \cdot x_{\text{solute}}$

b) $p = \mathrm{K_H} \cdot x$

c) $p_{\text{solute}} = p^\circ_{\text{solvent}} \cdot x_{\text{solvent}}$

d) $P_{Total} = P_{solvent}$

23. 1 mole of liquid A and 2 moles of liquid B make a solution having a total vapour pressure 40 torr. The vapour pressure of pure A and pure B are 45 torr and 30 torr respectively. The above solution **[1]**

a) is an ideal solution.

b) shows negative deviation.

c) shows positive deviation.

d) is a maximum boiling azeotrope.

24. Greater the value of KH, lower will be the **[1]**

a) Pressure

b) Solubility

c) Concentration

d) Temperature

25. A compound $CaCl_2 \cdot 6H_2O$ undergoes complete dissociation in water. The Van't Hoff factor **i** is: **[1]**

a) 6

b) 3

c) 4

d) 9

26. The plant cell will shrink when placed in: **[1]**

a) water

b) hypotonic solution

c) hypertonic solution

d) isotonic solution

27. Which of the following colligative properties is associated with the concentration term molarity? **[1]**

a) Osmotic pressure

b) Lowering of vap. pressure

c) Elevation in b.p.

d) Depression in f.p.

28. The osmotic pressure of a solution containing 0.02 mole of solute at 300 K will be: **[1]**

a) $0.02 \times 0.0821 \times 300\ atm$

b) $\frac{0.02 \times 300}{0.0821} atm$

c) $0.03 \times 0.821 \times 300\ atm$

d) $\frac{0.02 \times 0.0821}{300} atm$

29. Which one of the following pairs will form an ideal solution? **[1]**

a) n-hexane and n-heptane

b) ethanol and acetone

c) phenol and aniline

d) chloroform and acetone

30. The molarity of 900 g of water is **[1]**

a) 50 M

b) Cannot be calculated

c) 55.55 M

d) 5 M

31. Mathematical expression relating molarity and molality is **[1]**

a) $\frac{\rho}{M} = \frac{1}{m} + \frac{Mass\ of\ solute}{1000}$

b) $\frac{\rho}{M} = \frac{1}{m} + \frac{Mass\ of\ solution}{1000}$

c) $\frac{M}{\rho} = \frac{1}{m} + \frac{Mass\ of\ solute}{1000}$

d) $\frac{\rho}{m} = \frac{1}{M} + \frac{Mass\ of\ solvent}{1000}$

32. Which of the following aqueous solution will have highest boiling point? **[1]**

a) 2.0 M K_2SO_4

b) 1.0 m K_2SO_4

c) 2.0 M KCl

d) 1.0 M KCl

33. Ethylene glycol is added to water as antifreeze. It will **[1]**

a) Only decrease the freezing point of water

b) Only increase the boiling point of water

c) Decrease the freezing point of water in the winter and increase the boiling point of water in the summer.

d) It is used to clean the radiator in car

34. If molality of a dilute solution is doubled, the value of the molal elevation constant (K_b) will be **[1]**

a) doubled

b) unchanged

c) halved

d) tripled

35. Which is not a colligative property? **[1]**

a) Lowering of vapour pressure

b) Freezing point

c) Elevation of boiling point

d) Osmotic pressure

36. Which among the following is an example of liquid in solid? **[1]**

a) Aerated drinks

b) Mercury in zinc

c) Sugar solution

d) Alloys

37. Normality of 0.3 M phosphoric acid is **[1]**

a) 0.9

b) 0.1

c) 0.6

d) 0.5

38. Which of the following colligative property is used to find the molar mass of proteins? **[1]**

a) Depression in freezing point

b) Osmotic pressure

c) Elevation in boiling point

d) Relative lowering of vapour pressure

39. Which among the following form nearly ideal solutions? **[1]**

a) Chloroform and benzene

b) Benzene and Toluene

c) Alcohol and water

d) Acetone and aniline

40. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to : **[1]**

a) low atmospheric pressure

b) low temperature

c) both low temperature and high atmospheric

d) high atmospheric pressure

pressure

41. The depression in freezing point for 1M urea, 1 M glucose and 1 M NaCl are in the ratio of **[1]**

a) 1:1:2 b) 3:2:2

c) 1:1:1 d) 1:2:3

42. 25mL of a solution of barium hydroxide on titration with 0.1molar solution of hydrochloric acid give a titre value of 35mL. The molarity of Barium hydroxide solution is **[1]**

a) 0.14 b) 0.28

c) 0.07 d) 0.35

43. Solubility of gas in liquid decreases with increase in **[1]**

a) Pressure b) Number of solute molecules

c) Volume d) Temperature

44. The tanks used by divers are filled with air diluted with **[1]**

a) Helium b) Argon

c) Nitrogen d) Hydrogen

45. Which will form maximum boiling azeotrope? **[1]**

a) $C_2H_5OH + H_2O$ b) $H_3NO_2 + H_2O$

c) $HNO_3 + H_2O$ d) $C_6H_6 + C_6H_5CH_3$

46. Isotonic solutions have same _____. **[1]**

a) vapour pressure b) boiling temperature

c) osmotic pressure d) freezing temperature

47. 0.1 M solution of urea, at a given temperature, is isotonic with: **[1]**

a) 0.1 M glucose solution b) 0.1 M $BaCl_2$ solution

c) 0.1 M NaCl solution d) 0.02 M KCl solution

48. The concentration of a solution is 0.3×10^{-2} moles/litre. The osmotic pressure of the solution at 300K is **[1]**

a) 0.821 atm b) 0.0821 atm

c) 8.314 atm d) 8.21 atm

49. Elevation of boiling point is inversely proportional to **[1]**

a) molar mass of solute (M) b) molality (m)

c) weight of solute (W) d) molal elevation constant (K_b)

50. An azeotropic mixture of two liquids will have a boiling point lower than either of the two liquids when it **[1]**

a) shows a positive deviation from Raoult's law b) forms an ideal solution

c) is saturated d) shows a negative deviation from Raoult's law

51. 4L of 0.02 M aqueous solution of NaCl was diluted by adding one litre of water. The molarity of the resultant **[1]**

solution is _____.

a) 0.016
b) 0.012
c) 0.008
d) 0.004

52. For dissolution of gases in liquids, the concentration of a gas in a liquid is: **[1]**

a) proportional to the vapour pressure of the gas
b) lower to the pressure of the gas as compared to the liquid
c) proportional to the pressure of the gas over the liquid
d) equal to the pressure of the gas in relation to the liquid

53. The boiling point of a 0.2 m solution of a nonelectrolyte in water is (K_b for water = 0.52 K kg mol^{-1}) **[1]**

a) 100°C
b) 100.52°C
c) 100.26°C
d) 100.104°C

54. On dissolving ammonium chloride in water at room temperature, the solution feels cool to touch. Under which of the following conditions does salt dissolve faster? **[1]**

a) Salt crystals in cold water
b) Powdered salt in cold water
c) Powdered salt in hot water
d) Salt crystals in hot water

55. Which among the following is an example of a solid solution in which the solute is a gas? **[1]**

a) Hydrated salts
b) Humidity in air
c) Pumice stone
d) Aerated drinks

56. The isotonic solution have: **[1]**

a) same clinical properties
b) different colligative properties
c) different osmotic pressure
d) equimolar concentrations

57. Liquid ammonia bottle is first cooled before opening because **[1]**

a) Vapour pressure increases on cooling
b) Vapour pressure Same on cooling
c) Vapour pressure decreases on cooling
d) Vapour pressure of liquid ammonia is very low at room temperature

58. Value of Henry's law constant K_H _____. **[1]**

a) increases with increase in temperature.
b) decreases with increase in temperature.
c) first increases then decreases.
d) remains constant.

59. Which among the following is soluble in water? **[1]**

a) Phenol
b) Formic acid
c) Benzene
d) Chloroform

60. An aqueous solution of methanol and water has vapour pressure **[1]**

a) Equal to that of water
b) More than that of water
c) Equal to that of methanol
d) Less than that of water

61. Considering the formation, breaking and strength of hydrogen bond, predict which of the following mixtures **[1]**

will show a positive deviation from Raoult's law?

a) Chloroform and acetone.
b) Nitric acid and water.
c) Phenol and aniline.
d) Methanol and acetone.

62. Amount of NaOH required to neutarlize 1.5 L of 0.1 N HCl **[1]**

a) 4 g
b) 6 g
c) 40 g
d) 60 g

63. 50 mL of an aqueous solution of glucose $C_6H_{12}O_6$ (Molar mass: 180 g/mol) contains 6.02×10^{22} molecules. **[1]**
The concentration of the solution will be

a) 2.0 M
b) 0.1 M
c) 1.0 M
d) 0.2 M

64. The factor $\frac{\Delta T_f}{K_f}$ represents **[1]**

a) formality
b) molarity
c) normality
d) molality

65. Calculate the molarity of liquid HCl solution whose density is 1.17 g/cm^3. **[1]**

a) 36.5
b) 32.05
c) 18.25
d) 42.10

66. To neutralize completely 20 mL of 0.1 M aqueous solution of phosphorus acid (H_3PO_3) the volume of 0.1 M **[1]**
aqueous KOH solution required is

a) 40 mL
b) 20 mL
c) 10 mL
d) 60 mL

67. A compound undergoes complete dimerization in a given organic solvent. The Van't Hoff factor **i** is: **[1]**

a) 0.5
b) 5
c) 1
d) 2

68. A compound undergoes complete tetramerization in a given organic sovent. The Van't Hoff factor **i** is: **[1]**

a) 4.0
b) 2.0
c) 0.25
d) 0.125

69. The temperature at which the vapour pressure of a liquid equals external pressure is called: **[1]**

a) m.p
b) fp
c) critical temperature
d) b.p

70. When the soda bottle is opened, some of the dissolved carbon dioxide gas escapes because of: **[1]**

a) to reach a new equilibrium condition required for the higher pressure.
b) difference in solubility of carbon dioxide at different pressures.
c) some of the undissolved carbon dioxide gas in the soda bottle.
d) difference in solubility of carbon dioxide at different temperatures.

71. Isotonic solutions have: **[1]**

a) same osmotic pressure
b) same boiling point
c) same vapour pressure
d) same melting point

72. Which of the following is not an example of osmosis? **[1]**

a) Raw mangoes shrivel when pickled in brine
b) Exchange of gases in lungs
c) Blood cells collapse when suspended in saline
d) Wilted flowers revive when placed in fresh water

73. Which among the following shows a negative deviation from Raoult's law? **[1]**

a) Acetone and chloroform
b) Acetone and benzene
c) Methyl alcohol and water
d) Carbon tetrachloride and chloroform

74. The unit of Ebullioscopic constant is _____. **[1]**

a) K kg mol^{-1} or K $(molality)^{-1}$
b) kg mol^{-1} K^{-1} or $K^{-1}(molality)^{-1}$
c) K mol kg^{-1} or K (molality)
d) mol kg K^{-1} or K^{-1}(molality)

75. The size of a raw mango shrinks to a much smaller size when kept in a concentrated salt solution. Which one of the following processes can explain this? **[1]**

a) Osmosis
b) Reverse osmosis
c) Dialysis
d) Diffusion