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CHEMISTRY

BOOKS - MBD CHEMISTRY (ODIA ENGLISH)

SOLUTIONS

QUESTION BANK

1. Define the term solution.

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2. How many types of solutions are formed ?

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3. Name the types of solutions .

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4. Which law governs the dissolution of a gas in a liquid ?

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5. Between sea water and drinking water which will freeze at lower temperature?

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6. Between sea water and pure water, which boils at a higher temperature ?

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7. What is the effect of increase of pressure on the solubility of a gas in liquid ?

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8. In which type of liquid, an ionic solid will go into solution ?

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9. Name one factor which influences the solubillity of a gas in a solvent .

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10. What is the effect of pressure on the boilling point of a liquid ?

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11. How does the boiling point of a liquid change with decrease in atmospheric pressure ?

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12. Between sea water and drinking water which will freeze at lower temperature?

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13. What is the melting point of ice in Kelvin scale ?

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14. Between sea water and pure water, which boils at a higher temperature ?

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15. What is Van't Hoff equation for osmotic pressure ?

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16. How ΔT_f is related with molality ?

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17. What is molal elevation constant of a solvent ?

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18. Among 1M solution of glucose , NaCl, $FeCl_3$, $CaCl_2$, which one has the (a) highest boiling point (b) lowest boiling point ?

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19. What is an ideal solution ?

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20. What is a colligative property?

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21. Which of the following has higher vapour pressure at the same temperature ?

$CH_3OH(BP = 64.5^\circ C)$ and

$C_2H_5OH(BP = 78.3^\circ C$

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22. When temperature increases vapour pressure of liquid –

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23. Solubility of a gas in liquid, ____ with rise of temperature .

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24. At the boiling point of a liquid its vapour pressure is equal to _____.

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25. Polar solutes are _____ in non-polar solvents .

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26. At the boiling point of a liquid its vapour pressure is equal to _____.

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27. The vapour pressure of liquid ____ with rise of temperature .

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28. Solutions having same osmotic pressure are called _____

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29. On adding a solute, freezing point of solution _____ .

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30. On adding a solute, boiling point of solution _____ .

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31. On increasing concentration of a solution, osmotic pressure _____ .

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32. On adding a solute, vapour pressure _____ .

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33. With increase of altitude, the boiling point of water _____(increase,decreases,remains same)

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34. Two solutions having same osmotic pressure are called _____ solution .

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35. On adding a solute, freezing point of solution _____ .

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36. Solubility of a gas in liquid, increases with rise of temperature .

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37. How does the boiling point of a liquid change with decrease in atmospheric pressure ?

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38. Vapour pressure of solution decreases with ____ in temperature.

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39. On adding a solute, vapour pressure _____ .

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40. State henry's law.

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41. Define mole fraction .

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42. Calculate the molarity when 73 grams of HCl is dissolved in water to make 1500 ml solution.

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43. What do you understand by osmotic pressure ?

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44. Define molality. 29.25 gms of NaCl are present in 529.25 gms of solution . Find out the molality .

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45. 5.85 g of NaCl is dissolved in 90 g water what is the mole fraction of NaCl ?

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46. Derive the relationship between elevation in boiling point and molar mass.

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47. Compare the osmotic pressures of the following two solution at the same temperature :

1 M Glucose solution

1M barium chloride solution .

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48. Arrange the following in increasing order of their vapour pressure at room temperature. (Water, salt solution in water, alcohol – water solution)

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49. How does the vapour pressure of a liquid change with intermolecular force of attraction ?

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50. In which type of liquid, an ionic solid will go into solution ?

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51. What type of change takes place when suger is dissolved in a cup of tea ?

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52. What is freezing point of a liquid ?

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53. What is the freezing point of water at 1 atmospheric pressure in kelvin scales ?

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54. What is Osmotic pressure ?

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55. Define Ebullioscopic constant.

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56. Between sea water and pure water, which boils at a higher temperature ?

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57. Define osmosis.

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58. 15 gm of a substance dissolved in 450 gms of water produces a depression of -0.34° C in the freezing point . Calulation the Mol. Wt. of the solid (K_f for water is 1.86 K kg mol^{-1})

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59. What is the relationship between depression in freezing point of a solution and

molecular mass of the solute ?

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60. Why is the boiling point of a solution always higher than that of a pure solvent ?

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61. How would you justify that the relative lowering in vapour pressure is a colligative property ?

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62. What is Van't Hoff equation for osmotic pressure ?

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63. Distinguish between diffusion and osmosis.

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64. Define Van't Hoff factor.

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65. State and explain Hess's law.

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66. Explain the terms, .Molality, Molarity and Molfractions ..

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67. Derive the relationship between relative lowering of vapour pressure and molar mass of non-volatile solute.

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68. State Raoult's law. How is the molecular mass of a solute determined from lowering of vapour pressure measurement ?

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69. How can you determine the molecular mass of a non-volatile solute from depression of freezing point ?

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70. What is osmotic pressure? How can you explain it is a colligative property?

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71. What is Van't Hoff equation for osmotic pressure ?

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72. Discuss abnormal molecular masses in terms of Vant Hoff factor.

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73. Which is not an example of a solution?

A. Amalgam

B. Brass

C. Na in NH_3

D. Dust in air

Answer: B

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74. The process of osmosis was discovered by:

A. Pfeffer

B. Traube

C. Berkeley

D. Nollet

Answer: D

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75. Who proposed the concept that solute particles in solution behaves like gaseous molecules?

A. Boyle

B. van't Hoff

C. Nollet

D. Charles

Answer: B

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76. Osmotic pressure of non-aqueous solution is measured by:

A. Berkeley and Hartley method

B. Pfeffer's method

C. Morse and Frazer method

D. Townend's method

Answer: D

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77. Solubility of deliquescent substances in water is generally:

A. high

B. Low

C. Moderate

D. Can not be said

Answer: A

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78. The boiling point of $C_6H_6, CH_3OH, C_6H_5NH_2$ and $C_6H_5NO_2$ are $80^\circ C, 65^\circ C, 184^\circ C,$ and $212^\circ C$

respectively. Which will show highest vapour pressure at room temperature?

A. C_6H_6

B. CH_3OH

C. $C_6H_5NH_2$

D. $C_6H_5NO_2$

Answer: B

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79. Give one example each of solutions showing positive and negative deviation from Raoult,s law, with reason.

A. Lower

B. Higher

C. Same

D. Can not be said

Answer: B

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80. A pressure cooker reduces cooking time because:

A. Heat is more evenly distributed

B. B.p of water inside the cooker is increased

C. The high pressure tenderises the food

D. All

Answer: B

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81. Waterwill boil at $101.5^{\circ}C$ at which of the XT- following pressure:

A. 76 m of Hg

B. 76 mm of Hg

C. >76 cm of Hg

D. <76 cm of Hg

Answer: C

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82. Pick out the combination which show positive deviations from Raoult.s law:

A. Lower

B. Higher

C. Same

D. can not be said

Answer: A

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83. Which solution will show the maximum vapour pressure at 300 K ?

A. 1 M NaCl

B. 1 M $CaCl_2$

C. 1 M CH_3COOH

D. 1 M $C_{12}H_{22}O_{11}$

Answer: D

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84. The van't Hoff factor (i) for a dilute aqueous solution of glucose is:

A. Zero

B. 1

C. 1.5

D. 2

Answer: B

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85. Which pair shows a contractions in volume on mixing ?

A. $CHCl_3 + C_6H_6$

B. H_2O + HCl

C. $H_2O + HNO_3$

D. All

Answer: D

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86. If P_0 and P_δ are the vapour pressure of solvent and solution respectively and N_1 and N_2 are the mole of solute and solvent then:

A. $\frac{P_0 - P_\delta}{P_0} = \frac{N_1}{N_1 + N_2}$

B. $\frac{P_0 - P_\delta}{P_\delta} = \frac{N_1}{N_2}$

C. $P_\delta = P_0 . \frac{N_2}{N_1 + N_2}$

D. All

Answer: D

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87. Which characterises the weak intermolecular forces of attraction in a liquid ?

A. High boiling point

B. High vapour pressure

C. High critical temperature

D. High heat of vaporisation

Answer: B

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88. The phenomenon in which cells are swelled up and then burst if placed in hypotonic solutions is called:

A. Plasmolysis

B. Haemolysis

C. Exosmosis

D. None

Answer: B

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89. Shrinking of the cell due to out flow of water in a hypertonic solution is called _____.

A. Plasmolysis

B. Haemolysis

C. Endosmosis

D. None

Answer: A

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90. Equimolal solutions will have the same elevation in boiling point, provided they do not show:

A. Electrolysis

B. Association

C. Dissociation

D. Association or dissociation

Answer: D

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91. The $\triangle$ Tf is directly proportional to:

A. Normality

B. Molality

C. Molarity

D. None

Answer: B

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92. Pick out the combination which show positive deviations from Raoult.s law:

A. $C_2H_5OH + CCl_4$

B. $H_2O + CH_2CH_2CH_2OH$

C. $C_2H_5OH + CHCl_3$

D. All are correct

Answer: D

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93. If mole fraction of the solvent in a solution decreases then:

A. Vapour pressure of solution increases

B. B.pt. decreases

C. Osmotic pressure increases

D. All are correct

Answer: C

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94. In which of the following the van't Hoff Factor (i) is equal to one ?

A. NaCl

B. KNO_3

C. Urea

D. All

Answer: C

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95. A maxima or minima obtained in the temperature, composition curve of a mixture of two liquids indicates:

A. An azeotropic mixture

B. An eutectic formation

C. That the liquids are immiscible with one another

D. That the liquids are partially miscible at the maximum or minimum

Answer: A

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96. When the vapour pressure of solutions of two liquids are less than those expected from idea solutions, they are said to show:

A. Positive deviation from idea behaviour

B. Negative deviation from idea behaviour

C. Positive deviations for lower concentrations and negative deviations for higher concentration

D. None

Answer: B

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97. The natural semipermiable membrane is:

A. Gelatinous $Cu_2Fe(CN)_6$

B. Gelatinous $Ca_3(PO_4)_2$

C. cell wall

D. Phenol layer

Answer: C

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98. 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

Answer: C

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99. Just after slow crystallisation the solution in contact with the crystal is:

A. Dilute

B. Unsaturated

C. Saturated

D. Super saturated

Answer: D

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100. The van't Hoff factor (i) for a dilute solution of $K_3\left[Fe(CN)_6\right]$ is:

A. 10

B. 4

C. 5

D. 0.25

Answer: B

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101. Which of the following 0.1 M aqueous solutions will have the lowest freezing point :

A. Potassium sulphate

B. Sodium chloride

C. Urea

D. Glucose

Answer: A

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102. Which compound corresponds van.t Hoff factor (i) to be equal to 2 in dulite solution?

A. K_2SO_4

B. $NaHSO_4$

C. Sugar

D. $MgSO_4$

Answer: D

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103. The plant cells will shrink when placed in

A. Water

B. A hypotonic solution

C. A hypertonic solution

D. An isotonic solution

Answer: C

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104. 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

Answer: A

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105. A substance will be deliquescent if its vapour pressure is:

A. Equal to the atmospheric pressure

B. Equal to that of water vapourin the air

C. Greater than that of water vapour in the air

D. Lesser than that of water vapour in the air

Answer: D

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106. The process of getting freshwater from sea water is known as:

A. Osmosis

B. Filtration

C. Diffusion

D. Reverse Osmosis

Answer: D

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107. To form a super saturated solution of salt one must:

A. Super saturated

B. Unsaturated

C. Remains saturated

D. None

Answer: B

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108. A solution of chlorine in water contains:

A. Is equal to the solubility of that substance in water

B. Exceeds than its solubility

C. Less than its solubility

D. Continuously change

Answer: B

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109. The molal cryoscopic constant for water is:

A. 1.86 K $molality^{-1}$

B. 5.26 K $molality^{-1}$

C. 55.5 K $molality^{-1}$

D. 0.52 K $molality^{-1}$

Answer: A

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110. An aqueous solution is heated until it begins to boil. The atmospheric pressure is 760 mm of Hg. The boiling temperature will be:

A. $100^\circ C$

B. $> 100^\circ C$

C. $< 100^\circ C$

D. None

Answer: B

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111. The spontaneous movement of solute particles from a more concentrated solution to less concentrated solution is called:

A. Osmosis

B. Diffusion

C. Plasmolysis

D. Fusion

Answer: B

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112. At a suitable pressure near the freezing point of ice, there exists:

A. Only ice

B. Ice and water

C. Ice and steam

D. Ice, water and steam, all existing side by side

Answer: D

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113. A liquid is in equilibrium with its vapours at its boiling point. On the average the molecules in the two phases have equal:

A. Potential energy

B. Total energy

C. Kinetic energy

D. Intermolecular forces

Answer: C

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114. In the case of osmosis, solvent molecules move from:

A. Higher vapour pressure to lower vapour pressure

B. Higher concentration to lower concentration

C. Lower vapour pressure to higher vapour pressure

D. Higher osmotic pressure to lower osmotic pressure

Answer: A

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115. If molecular interaction between two different liquid molecules are stronger than the molecular interactions between the pure liquid molecules, the mixture is expected to show:

A. Positive deviations

B. Negative deviations

C. No Deviations

D. Positive as well as negative deviations

Answer: B

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116. The ratio of the value of any colligative property for KCl solution to that of sugar solution is:

A. 1

B. 0.5

C. 2

D. 4

Answer: C

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117. One the basis of intermolecular forces predict the correct order of decreasing boiling to that of sugar solution is:

A. $CH_3OH > H_2 > CH_4$

B. $CH_3OH > CH_4 > H_2$

C. $CH_4 > CH_3OH > H_2$

D. $H_2 > CH_4 > CH_3OH$

Answer: B

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118. If the temperature increases from $0^{\circ}C$ to $50^{\circ}C$ at atmospheric pressure, which of the following processes is expected to take place more in case of liquids ?

A. Fusion

B. Vaporisation

C. Solubilization

D. None

Answer: B

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119. The reverse of fusion is freezing and it is:

A. Endothermic

B. Exothermic

C. Neither exothermic nor endothermic

D. May be exothermic or endothermic

Answer: B

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120. The most suitable method for the detemination of molecular weight of oxyhaemoglobin, a compound of high molecular weight is:

A. Osmotic pressure method

B. Vapour pressure lowering method

C. Elevation of boiling point mehod

D. None

Answer: A

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121. The van't Hoff factor (i) for a dilute solution of $K_3\left[Fe(CN)_6\right]$ is:

A. $Al_2(SO_4)$

B. NaCl

C. $Al(NO_3)_3$

D. Na_2SO_4

Answer: A

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122. The lubricating action of an oil is more if it possess:

A. High vapour pressure

B. Low vapour pressure

C. High surface tension

D. High density

Answer: B

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123. Generally those gases are soluble in water to a greater extent which:

A. Are easily liqefied

B. Are ionsed in water

C. React with water

D. All are correct

Answer: D

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124. The energy that favours dissolution of a solute in water is known as:

A. Hydration energy

B. Lattice energy

C. Ionisation energy

D. Exothermic energy

Answer: A

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125. The energy that opposes the dissolution of a solute in a solvent is called:

A. Solvent energy

B. Hydration energy

C. Lattice energy

D. Ionisation energy

Answer: C

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126. For an ideal binary liquid solution with $P_A^\circ > P_B^\circ$ which relation between X_A (mole fraction of A in liquid phase) and Y_A (mole fraction of A in vapour phase) is correct, X_B and Y_B are mole fraction of B in liquid and vapour phase respectively

A. $X_A = Y_A$

B. $X_A > Y_A$

C. $\frac{X_A}{X_B} < \frac{Y_A}{Y_B}$

D. X_A, Y_A, X_B and Y_B cannot be corelated

Answer: C

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127. Which of the following precipitate can act as a semipermeable membrane?

A. Calcium phosphate (gelatinous)

B. Phenol layer

C. Copper ferrocyanide (gelatinous)

D. All

Answer: D

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128. In cold countries, ethylene glycol is added to water in the radiators of cars during winters. It results in:

A. Lowering in boiling point

B. Reducing viscosity

C. Reducing specific heat

D. Lowering in freezing point

Answer: D

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129. Beckmann's thermometer are used to measures:

A. Boiling point of the solution

B. Freezing point of the solution

C. Any temperature

D. Elevation in boiling point or depression in freezing point

Answer: D

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130. Equimolal solutions of A and B show depression in freezing point in the ratio 2 : 1. A remains in its normal state in solutions. B will be in solution:

A. Normal

B. Dissociated

C. Associated

D. Hydrolysed

Answer: C

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131. The vapour pressure of a solution of a non-volatile electrolyte (B) in a solvent (A) is 95% of the vapour pressure of the solvent at the same temperature. If the molecular weight of the solvent is 0.3 times the molecular weight of solute, the weight ratio of the solvent and solute are:

A. 0.12

B. 6

C. 0.2

D. 4

Answer: B

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132. The plots of $\frac{1}{X_A} vs$, $\frac{1}{Y_A}$ (where X_A and Y_A are the mole fraction of liquid A in liquid and vapour phase respectively) is linear slope and intercepts respectively:

A. $\frac{P_A^\circ}{P_B^\circ}$ and $\frac{P_A^\circ - P_B^\circ}{P_B^\circ}$

B. $\frac{P_A^\circ}{P_B^\circ}$ and $\frac{P_B^\circ - P_A^\circ}{P_B^\circ}$

C. $\frac{P_B^\circ}{P_A^\circ}$ and $\frac{P_A^\circ - P_B^\circ}{P_B^\circ}$

D. P_B° / P_A° and $\frac{P_B^\circ - P_A^\circ}{P_B^\circ}$

Answer: B

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133. Which aqueous solution has minimum freezing point ?

A. 0.01 M NaCl

B. 0.005 M C_2H_5OH

C. 0.005 M Mgl_2

D. 0.005 M $MgSO_4$

Answer: A

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134. Which solution will have the highest boiling point ?

A. 1% glucose in water

B. 1% sucrose in water

C. 1% NaCl in water

D. 1% $CaCl_2$ in water

Answer: C

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135. Which aqueous solution has minimum freezing point ?

A. 1 molar NaCl solution

B. 1 molar KCl solution

C. 1 molar $CaCl_2$ solution

D. 1 molar urea solution

Answer: C

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136. Which solution will have least vapour pressure ?

A. 0.1 M $BaCl_2$

B. 0.1 M urea

C. 0.1 M Na_2SO_4

D. 0.1 M Na_3PO_4

Answer: D

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

A. $BaCl_2$ > NaCl > glucose

B. Glucose > NaCl > $BaCl_2$

C. NaCl > $BaCl_2$ > glucose

D. NaCl > glucose > $BaCl_2$

Answer: A

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138. The lowering of vapour pressure of 0.1M aqueous solutions of NaCl, $CuSO_4$, and K_2SO_4 are:

A. All equal

B. In the ratio of 1 : 1 : 1.5

C. In the ratio of 3 : 2 : 1

D. In the ratio of 1.5 : 1 : 2.5

Answer: B

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139. Which has maximum freezing point ?

A. 1 molar of NaCl solution

B. 1 molar of KCl solution

C. 1 molar of $CaCl_2$ solution

D. 1 molar of urea solution

Answer: D

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140. Which solution will produce maximum elevation in b.pt. ?

A. 0.1 M glucose

B. 0.1 M sucrose

C. 0.1 M $BaCl_2$

D. 0.1 M $MgSO_4$

Answer: C

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141. Which has the highest freezing point at one atmoshpere ?

A. 0.1 M NaCl solution

B. 0.1 M sugar solution

C. 0.1 M $BaCl_2$ solution

D. 0.1 M $FeCl_3$ solution

Answer: B

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142. The ration of the value of any colligative property for KCI solution to that for sugar solution is nearly .....times

A. 1

B. 0.5

C. 2

D. 2.5

Answer: C

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143. One mole on non-volatile solute is dissolved in two mole of water. The vapour

pressure of the solution relative to that of water is:

A. 2/3

B. 1/3

C. 1/2

D. 3/2

Answer: A

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144. A solution has an osmotic pressure of 0.821 atm at 300 K. Its concentration would be:

A. 0.0033M

B. 0.66 M

C. 0.033 M

D. 0.33 M

Answer: C

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145. 5% (wt./vol.) aqueous NaCl solution and 5% (wt./vol.) aqueous KCl solution are:

A. Isotonic

B. Isomolar

C. Isoequimolar

D. None

Answer: D

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146. 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.

A. $5.41\ \%$

B. $3.54\ \%$

C. $4.53\ \%$

D. $53.4\ \%$

Answer: A

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147. The osmotic pressure of a 5% (wt./vol.) solution of cane sugar(mol.wt is 342) at $15^{\circ}C$ is:

A. 4 atm

B. 3.4 atm

C. 5.078 atm

D. 2.45 atm

Answer: C

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148. The freezing points of a 0.05 molal solution of a non-electrolyte in water is: (K, = 1.86 K $molality^{-1}$)

A. $-1.86^{\circ}C$

B. $-0.093^{\circ}C$

C. $-0.93^{\circ}C$

D. $0.093^{\circ}C$

Answer: C

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149. The freezing point of 1 molar NaCl solution assuming NaCl to be $100\,\%$ dissociated in water is: (K_f = 1.86 K $molality^{-1}$)

A. $-1.86^\circ C$

B. $-3.72^\circ C$

C. $+1.86^\circ C$

D. $+3.72^\circ C$

Answer: B

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150. The molar freezing point constant of water is 1.86 K $molality^{-1}$. If 342 g of cane sugar ($C_{12}H_{22}O_{11}$) are 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. $2.42^{\circ}C$

Answer: A

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151. Osmotic pressure of a solution containing 0.1 mole of solute per litre at 273 K is:

A. $\frac{0.1}{1} \times 0.08205 \times 273$ atm

B. $0.1 \times 2 \times 0.08205 \times 273$ atm

C. $\frac{1}{0.1} \times 0.08205 \times 273$ atm

D. $\frac{0.1}{1} \times \frac{273}{0.08205} \times 273$ atm

Answer: A

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152. Osmotic pressure of 40% (wt./vol.) urea solution is 1.64 atm and that of 3.42% (wt./vol.) cane sugar is 2.46 atm. When equal volumes of the above two solutions are mixed, the osmotic pressure of the resultng solution is:

A. 1.64 atm

B. 2.46 atm

C. 4.10 atm

D. 2.05 atm

Answer: D

153. Following solutions at the same temperature will be isotonic:

A. 3.42 g of cane sugar in one litre water and 0.18 g of glucose in one litre water

B. 3.42 g of cane sugar in one litre water and 0.18 g of glucose in 0.1 litre water

C. 3.42 g of cane sugar in one litre water and 0.585 g of NaCl in one litre water

D. 3.42 g of cane sugar in one litre water and 1.17 g of NaCl in one litre water

Answer: B

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154. Molal depression of freezing point of water is $1.86^{\circ} C$ per 1000 g of water. 0.02 mole of urea dissolved in 100 g of water will produce a lowering of temperature of:

A. 0.186°

B. 0.372°

C. 1.86°

D. 3.72°

Answer: B

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155. Dry air was passed successively through a solution of 5 g of a solute in 180 g of water and then through pure water. The loss in weight of solution was 2.50 g and that of pure solvent 0.04 g The molecular weight of the solute is:

A. 31.25

B. 3.125

C. 312.5

D. None

Answer: A

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156. The osmotic pressure of decimolar solution of glucose at $30^{\circ} C$ is:

A. 24.88 atm

B. 2.488 atm

C. 248.8 atm

D. None

Answer: B

Watch Video Solution

157. Osmostic pressure of a solution (density is 1 g/ml) containing 3 g of glucose (molecular weight =180) in 6o g of water at $15^{\circ}C$ is:

A. 0.34 atm

B. 0.65 atm

C. 6.25 atm

D. 5.57 atm

Answer: C

Watch Video Solution

158. What would be the freezing point of aqueous solution containing 17 g of C_2H_5OH in 1000 g of water K_f = 1.86 K $molality^{-1}$:

A. $-0.69^\circ C$

B. $-0.34^{\circ} C$

C. $0.0^{\circ} C$

D. $0.34^{\circ} C$

Answer: A

Watch Video Solution

159. A solution containing 8.6 g urea in one litre was found to be isotonic with a 5% (wt./vol.) solution of an organic non-volatile solute. The molecular weight of latter is:

A. 348.9

B. 34.89

C. 3489

D. 861.2

Answer: A

 Watch Video Solution

160. 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 $27^{\circ}C$. The molecular weight of solute is:

A. 14.97

B. 149.7

C. 1697

D. 1.497

Answer: B

Watch Video Solution

161. A solution of 1.25 g of a non-electrolyte in 20 g of water freezing at 271.9K with its molal depression constant , then the molecular wt. of the solute is:

A. 207.8 g/mol

B. 179.79 g/mol

C. 209.6 g/mol

D. 105.68 g/mol

Answer: D

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Watch Video Solution

162. The molal elevation constant of water = 0.52 K, $molality^{-1}$. The boiling point of 1.0 molal aqueous KCl solution (assuming complete dissociation of KCl), should be:

A. $100.52^{\circ}C$

B. $101.04^{\circ}C$

C. $99.48^{\circ}C$

D. $98.96^{\circ}C$

Answer: B

 Watch Video Solution

163. In a solution of 7.8 g benzene (C_6H_6) and 46.0 g toluene ($C_6H_5CH_3$) the mole fraction of benzene is:

A. 1/6

B. 1/5

C. 1/2

D. 1/3

Answer: A

Watch Video Solution

164. If a 6.84% (wt/vol.) solution of cane sugar (mol.wt.=342) is isotonic with 1.52% (wt/vol.) solution of thiocarbamide, then the molecular weight of thiocarbamide is:

A. 152

B. 76

C. 60

D. 180

Answer: B

 Watch Video Solution

165. The normal amount of glucose in 100 mL of blood (8-12hours after a meal) is:

A. 8 mg

B. 80 mg

C. 200 mg

D. 800 mg

Answer: B

Watch Video Solution

166. Osmotic pressure of a sugar solution at $24^{\circ} C$ is 2.5 atmosphere. The concentration of the solution in mol per litre is:

A. 10.25

B. 1.025

C. 1025

D. 0.1025

Answer: D

Watch Video Solution

167. At $40^\circ C$ the vapour pressures of pure liquids, benzene and toluene, are 160 mm Hg and 60 mm Hg respectively. At the same temperature, the vapour pressure of an

equimolar solution of the two liquids, assuming the ideal solution should be:

A. 140 mm Hg

B. 110 mm Hg

C. 220 mm Hg

D. 100 mm Hg

Answer: B

Watch Video Solution

168. Elevation in boiling point was $0.52^{\circ}C$ when 6 g. of a compound X was dissolved in 100 g of water. Molecular weight of X is-

A. 120

B. 60

C. 180

D. 342

Answer: B

Watch Video Solution

169. 1 litre of a solution containing 500 g of a protein exerts an osmotic pressure of 0.82 atm at $27^{\circ}C$.The molecular weight of the protein is:

A. 82000

B. 50000

C. 41000

D. 15000

Answer: D

Watch Video Solution

170. The concentration of glucose (in g/litre)solution which is isotonic with a solution of urea containing 6 g per litre will be:

A. 6

B. 34.2

C. 18

D. 1.8

Answer: C

Watch Video Solution

171. A solution containing 1 mole of ethylene glycol dissolved in 1000 g of water $\left(K_f = 1.86 Kmolality^{-1}\right)$ will freez at:

A. $-5.2^\circ C$

B. $-0.52^\circ C$

C. $-18.6^\circ C$

D. $-1.86^\circ C$

Answer: C

 Watch Video Solution

172. Solute A is a ternary electrolyte and solute B is non-electrolyte. If 0.1 M solution of solute B produces an osmotic pressure of 2P, then 0.05 M solution of A at the same temperature will produce an osmatic pressure equal to:

A. P

B. 1.5P

C. 2P

D. 3P

Answer: D

Watch Video Solution

173. The molal elevation constant for water is 0.52 $K.molality^{-1}$. The elevation caused in the boiling point of water by dissolving 0.25 mole of a non-volatile solute in 250 g of water will be:

A. $52^{\circ} C$

B. $5.2^{\circ} C$

C. $0.52^{\circ} C$

D. $0.052^{\circ} C$

Answer: C

Watch Video Solution

174. A $3.42\ \%$ (wt./vol.) solution of cane suger is isotonic with a $5.96\ \%$ (wt./vol.) solution of raffinose. The molecular weight of raffinose is:

A. 59.6

B. 596

C. 5.96

D. 5960

Answer: B

Watch Video Solution

175. At $27^{\circ}C$, the osmotic pressure of a solution containing 4.0 g solute (molar mass =

246) per litre at $27^{\circ}C$ is : R = 0.0821 atms. mol^{-1}k)

A. 0.1 atm

B. 0.4 atm

C. 0.2 atm

D. 0.8 atm

Answer: C

Watch Video Solution

176. The vapour pressure of benzene at $80^{\circ}C$ is 750 mm. The molecular weight of the substance will be:

A. 15

B. 150

C. 1500

D. 148

Answer: D

View Text Solution

177. The mole fraction of water in a solution containing 50 g of water and 50 g of ethyl alcohol is:

A. 50/(50+50)

B. 18/(18+46)

C. 1.09/(1.09+2.78)

D. 2.78/(1.09+2.78)

Answer: D

Watch Video Solution

178. Which compound corresponds van.t Hoff factor (i) to be equal to 2 in dulite solution?

A. K_2SO_4

B. $NaHSO_4$

C. Sugar

D. $MgSO_4$

Answer: D

Watch Video Solution

179. 6 g urea is dissolved in 90 g water. The relative lowering of vapour pressure is equal to:

A. 0.0196

B. 0.06

C. 1.1

D. 0.02

Answer: A

 Watch Video Solution

180. What is the molality of ethyl alocohol (mol. Wt. = 46) in aqueous solution which freezes at $-10^{\circ}C$: (K_f for water = 1.86 K $molality^{-1}$)

A. 3.54

B. 4.567

C. 5.376

D. 6.315

Answer: C

Watch Video Solution

181. The vapour pressure of benzene at $90^{\circ}C$ is 1020 torr. A solution of 5 g of a solute in 58.5 g benzene has vapour pressure 990 torr. The molecular weight of the solute is:

A. 78.2

B. 178.2

C. 206.2

D. 220

Answer: D

Watch Video Solution

182. The vapour pressures 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:

A. 0.467

B. 0.502

C. 0.513

D. 0.556

Answer: C

Watch Video Solution

183. Y g of non-volatile organic substance of molecular mass M is dissolved in 250 g benzene. Molal elevation constant of benzene is K_b. Elevation in its boiling point is given by:

A. $\frac{M}{K_b Y}$

B. $\frac{4K_B y}{M}$

C. $\frac{K_b Y}{4M}$

D. $\frac{K_b Y}{M}$

Answer: B

Watch Video Solution

184. The values of observed and calculated molecular weights of silver nitrate are 92.64 and 170 respectively. The degree of dissociation of silver nitrate is:

A. $60\ \%$

B. $83.5\ \%$

C. $46.7\ \%$

D. $60.23\ \%$

Answer: B

Watch Video Solution

185. One molar solution of sodium chloride will have the relative lowering of vapour pressure closest to:

A. 5.8% (wt//vol.) urea solution

B. 5.8% (wt//vol.) glucose solution

C. 1.0 M glucose solution

D. 2.0 M urea solution

Answer: D

Watch Video Solution

186. At $88^{\circ}C$ 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 $88^{\circ}C$ at 1 atm pressure, benzene toluene form an ideal solution:

A. 0.416

B. 0.588

C. 0.688

D. 0.74

Answer: D

Watch Video Solution

187. The amount of urea to be dissolved in 500mL of water (K=18.6 K mol^{-1} 100 g solvent) to produce a depression of $0.186^{\circ}C$ in freezing point is:

A. 0.3 g

B. 3 g

C. 6 g

D. 9 g

Answer: B

Watch Video Solution

188. The molal boiling point constant of water is $0.53^{\circ}C$. When 2 mole of glucose are dissolved in 4000 g of water, the solution will boil at:

A. $100.53^{\circ}C$

B. $101.06^{\circ}C$

C. $100.265^{\circ}C$

D. $99.47^{\circ}C$

Answer: C

Watch Video Solution

189. The freezing point of equimolal aqueous solution will be highest for:

A. $C_6H_5NH_3Cl$

B. $Ca(NO_3)_2$

C. $LA(NO_3)_3$

D. $C_6H_{12}O_6$

Answer: D

Watch Video Solution

190. A solution containing 500 g of a protein per litre is isotonic with a solution containing 3.42 g of sucrose per litre. The molecular mass of protein is:

A. 5

B. 146

C. 34200

D. 50000

Answer: D

 Watch Video Solution

191. The molecular weight of NaCl determined by studying freezing point depression of its 0.5% aqueous solution is 30. The apparent degree of dissociation of NaCl is:

A. 0.95

B. 0.5

C. 0.6

D. 0.3

Answer: A

Watch Video Solution

192. The osmotic pressure of a solution at $0^\circ C$ is 2 atm. What will be its osmotic pressure at $273^\circ C$ under similar conditions:

A. 0.5 atm

B. 2×273 atm

C. 4 atm

D. $273/2$ atm

Answer: C

Watch Video Solution

193. The relative lowering of vapour pressure produced by dissolving 71.5 g of a substance in 1000 g of water is 0.00713. The molecular weight of the substance will be:

A. 180

B. 18

C. 342

D. 60

Answer: A

Watch Video Solution

194. The vapour pressure of two pure liquids (A) and (B) are 100 and 80 torr respectively. The total pressure of solution obtained by

mixing 2 mole of (A) and 3 mole of (B) would be:

A. 120 torr

B. 36 torr

C. 88 torr

D. 180 torr

Answer: C

Watch Video Solution

195. A solution containing 4 g of polyvinyl chloride in 1 litre of dioxane was found to have an osmotic pressure of 6×10^{-4} atm at 300 K. The molecular mass of the polymer is:

A. 3×10^{3}

B. 1.6×10^{5}

C. 5×10^{4}

D. 6.4×10^{2}

Answer: B

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Watch video solution

196. The depression in f.pt of 0.01 m aqueous solution of urea, sodium chloride and sodium sulphate is in the ratio:

A. 1 : 1 : 1

B. 1 : 2 : 3

C. 1 : 2 : 4

D. 2 : 2 : 3

Answer: B

Watch Video Solution

197. The values of observed and calculated molecular weights of calcium nitrate are respectively 65.6 and 164 . The degree of dissociation of calcium nitrate will be:

A. $25\ \%$

B. $50\ \%$

C. $75\ \%$

D. $60\ \%$

Answer: C

Watch Video Solution

198. A 5.8% (wt/vol.)NaCl solution will exert an osmotic pressure closest to which one of the following:

A. 5.8% (wt/vot.) sucrose solution

B. 5.8% (wt/vot.) glucose solution

C. 2 molal sucrose solution

D. 1 molal glucose solution

Answer: C

Watch Video Solution

199. 20 g of a binary electrolyte (mol. Wt. = 100) are dissolved in 500 g of water. The freezing point of the solution is $-0.74^{\circ}C$, K = 1.86 k $molality^{-1}$. The degree of ionization of the electrolyte is:

A. $50\ \%$

B. $75\ \%$

C. $100\ \%$

D. Zero

Answer: D

Watch Video Solution

200. The relationship between osmotic pressure at 273 K when 10 g glucose (P_1), 10 g urea (P_2) and 10 g sucrose (P_3) are dissolved in 250 ml of water is:

A. $P_1 > P_2 > P_3$

B. $P_3 > P_1 > P_2$

C. $P_2 > P_1 > P_3$

D. $P_2 > P_3 > P_1$

Answer: C

Watch Video Solution

201. van.t Hoff factor of very dilute solution of $Ca(NO_3)_2$ is:

A. 1

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

202. Lowering in vapour pressure is the highest for:

A. 0.2 m Urea

B. 0.1 m Glucose

C. $0.1mMgSO_4$

D. 0.1 m $BaCl_2$

Answer: D

Watch Video Solution

203. Azeotropic mixture of HCl and water has:

A. 84% HCl

B. 22.4% HCl

C. 63% HCl

D. 20.2% HCl

Answer: D

Watch Video Solution

204. What will be the molality of a solution having 18g glucose (m.wt. = 180) dissolved in 500 g of water:

A. 1 m

B. 0.5 m

C. 0.2 m

D. 2 m

Answer: C

Watch Video Solution

205. Which of the following will have the highest boiling point at 1 atm pressure:

A. 0.1 M NaCl

B. 0.1 M Sucrose

C. 0.1 M $BaCl_2$

D. 0.1 M Glucose

Answer: C

Watch Video Solution

206. An ideal solution was obtained by mixing methanol and ethanol. If the partial vapour pressure of methanol and ethanol are

$2.619KP_a$ and $4.556KP_a$ respectively, the composition of vapour (in terms of mole fraction) will be:

A. 0.625 MeOH, 0.365 EtOH

B. 0.365 MeOH, 0.635 EtOH

C. 0.574 MeOH, 0.326 EtOH

D. 0.173 MeOH, 0.827 EtOH

Answer: B

 Watch Video Solution

207. An aqueous solution freezes at $-0.186^{\circ}C\left(K_f = 1.86^{\circ} : K_b = 0.512^{\circ}\right)$. What is the elevation in boiling point:

A. 0.186

B. 0.512

C. 0.512/1.86

D. 0.0512

Answer: D

Watch Video Solution

208. 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 decrease in vapour pressure is 20 mm of Hg:

A. 0.8

B. 0.6

C. 0.4

D. 0.2

Answer: B

Watch Video Solution

209. Molal depression constant for water is $1.86^{\circ}C$. The freezing point of a 0.05 molal solution of a non electrolyte in water is:

A. $-1.86^{\circ}C$

B. $-0.93^{\circ}C$

C. $-0.093^{\circ}C$

D. $0.93^{\circ}C$

Answer: C

 Watch Video Solution

210. The freezing point of a solution prepared from 1.25 g of non-electrolyte and 20 g of water is 271.9 K. If molar depression constant is 1.86 K mol^{-1} then molar mass of the solute will be:

A. 105.7

B. 106.7

C. 115.3

D. 93.9

Answer: A

Watch Video Solution

211. A 5% solution of cane sugar (M. wt = 342) is isotonic with 1% solution of substance X. The molecular weight of X is:

A. 171.2

B. 68.4

C. 34.2

D. 136.2

Answer: B

Watch Video Solution

212. The amount of ice that will separate out on cooling a solution containing 50 g of ethylene glycol in 200 g water to $-9.3^{\circ}C$ is:

$\left(K_f = 1.86 Kmolality^{-1}\right)$

A. 38.71 g

B. 37.71 mg

C. 42 g

D. 42 mg

Answer: A

 Watch Video Solution

213. A 0.2 molal aqueous solution of a weak acid (HX) is 20 percent ionised. The freezing

point of this solution is: (K_f = 1.86 K/m for water)

A. $-0.45^\circ C$

B. $-0.90^\circ C$

C. $-0.31^\circ C$

D. $-0.53^\circ C$

Answer: A

Watch Video Solution

214. The following aqueous solution in the correct order of decreasing freezing points is:

A. $0.2MBaCl_2, 0.2MKCl, 0.1MNa_2SO_4$

B. $0.2MKCl, 0.1MNa_2SO_4, 0.2MBaCl_2$

C. $0.1MNa_2SO_4, 0.2MKCl, 0.2MBaCl_2$

D. $0.1MNa_2SO_4, 0.2MBaCl_2, 0.2MKCl$

Answer: C

Watch Video Solution

215. Insulin $(C_2H_{10}O_5)_n$ is dissolved in a suitable solvent and osmotic pressure (π) of solutions of various concentrations (gcm^{-3}) C is measured at $20^\circ C$. The slope of a plot of π against C is found to be 4.65×10^{-3}. The molecular weight of the insulin is:

A. 4.8×10^5

B. 9×10^5

C. 3×10^5

D. 5.16×10^6

Answer: D

Watch Video Solution

216. At $40^\circ C$ the vapour pressures in torr, of methyl alcohol ethyl alcohol solutions is represented by the equation. $P = 119X_A + 135$, where X_A is mole-fraction of methyl alcohol, then the value of $\lim_{X_{A \to 1}} \frac{P_A}{X_A}$ is:

A. 254 torr

B. 135 torr

C. 119 torr

D. 140 torr

Answer: A

Watch Video Solution

217. The boiling point of an aqueous solution of a nonvolatile solute is $100.15^{\circ}C$. What is the freezing point of an aqueous solution obtained by diluting the above solution with

an equal volume of water? The value of K_b and K_f for water are $0.512^\circ C$ and $1.86^\circ C$ K $molality^{-1}$:

A. $-0.544^\circ C$

B. $-0.512^\circ C$

C. $-0.272^\circ C$

D. $-1.86^\circ C$

Answer: C

Watch Video Solution

218. The freezing point of aqueous solution that contains 5% by mass urea, 1.0% by mass KCl and 10% by mass of glucose is: $\left(K_f H_2O = 1.86 K molality^{-1}\right)$:

A. 290.2 K

B. 285.5 K

C. 269.93 K

D. 250 K

Answer: C

Watch Video Solution

219. A solution of protein (extracted from crabs) was prepared by dissolving 0.75 g in 125 cm^3 of an aqueous solution. At $4^\circ C$ an osmotic pressure rise of 2.6 mm of the solution was observed. Then molecular weight of protein is (Assume density of solution is $1.00\frac{g}{c}m^3$):

A. 9.4×10^5

B. 5.4×10^5

C. 5.4×10^{10}

D. 9.4×10^{10}

Answer: B

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220. A substance is completely trimerised on dissolution in a solvent. The van.t Hoff factor (i) for such change is:

A. 1

B. 2

C. 3

D. 1/3

Answer: D

Watch Video Solution

221. van.t Hoff factor for a dilute solution of sodium argento cyanide is:

A. 2

B. 0.25

C. 0.5

D. 3

Answer: A

Watch Video Solution

222. At $40^\circ C$, the vapour pressures (in torr) of methyl alcohol (A) and ethyl alcohol (B) solution is represented by: $P = 120X_A + 138$, where X_A is mole-

fraction of methyl alcohol, then the value of $\lim X_A \to 0 \frac{P_B^\circ}{X_B}$ and $\lim X_B \to 0 \frac{P_A^\circ}{X_A}$ are:

A. 138, 258

B. 258, 138

C. 120, 138

D. 138, 125

Answer: A

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223. The use of common salts, e.g., NaCl or $CaCl_2$ anhydrous is made to clear snow on the roads. This causes:

A. A lowering in f.pt. of water

B. A lowering in m.pt. of ice

C. Ice melts at the temperature of atmosphere present at that time

D. All

Answer: D

Watch Video Solution

224. 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

Answer: B

Watch Video Solution

225. In which of the following molecular weight determination methods, sensitivity of the measurements decreases as the molecular weight of the solute increases ?

A. Elevation of boiling point/depression in f.pt.

B. Viscosity

C. Osmotic pressure

D. None

Answer: A

Watch Video Solution

226. Who was awarded Nobel Prize for chemistry in 1901 for discovering laws of osmotic pressure for solutions ?

A. van't Hoff

B. Pauling

C. Berkeley

D. Seaberg

Answer: A

Watch Video Solution

227. When crystal of the solute is introduced into a super saturated solution of the solute:

A. The solute dissolves

B. The excess solute crystallises out

C. The solution becomes unsaturated

D. The solution remains super saturated

Answer: B

Watch Video Solution

228. Vapour pressure of a solution containing non-volatie solute is:

A. More than the vapour pressure of a solvent

B. Less than the vapour pressure of solvent

C. Equal to the vapur pressure of solvent

D. None

Answer: B

Watch Video Solution

229. The relative lowering of vapour pressure is equal to the mole fraction of the non-volatile solute. This statement was given by:

A. Raoult

B. Henry

C. Joule

D. Dalton

Answer: A

Watch Video Solution

230. which of the following will have highest osmotic pressure:

A. 0.001M $Al_2(SO_4)_3$

B. 0.001M $BaCl_2$

C. 0.001M Na_2SO_4

D. glucose

Answer: A

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231. When a solution is separated from a solvent by semipermeable membrane, then phenomenon taking place is called as:

A. Osmosis

B. Diffusion

C. Solubility

D. None

Answer: A

 Watch Video Solution

232. When a substabce is dissolved in a solvent, the vapour pressure of solvent decresases. This brings:

A. An increase in b.pt. of the solution

B. A decrease in b.pt. of a solution

C. An increase in f.pt. of the solvent

D. None

Answer: A

 Watch Video Solution

233. If a thin slice of sugar beet is placed in concentrated solution of NaCl then:

A. Sugar beet will lose water from its cells

B. Suagar beet will absorb water from solution

C. Sugar beet will neither absorb nor lose water

D. Sugar beet will dissolve in solution

Answer: A

Watch Video Solution

234. The temperature at which vapour pressure of a solvent in its liquid and solid phase becomes same is called:

A. b.pt.

B. f.pt.

C. Krafft point

D. None

Answer: B

Watch Video Solution

235. As a result of osmosis, the volume of the concentrated solution:

A. Gradually decreases

B. Gradually increases

C. Suddenly increases

D. None

Answer: B

Watch Video Solution

236. The osmotic, pressure of a solution can be accurately measure in the shortest possible time by:

A. Berkrley and Hartley method

B. Morse and Frazer method

C. Pfeffer method

D. None

Answer: A

Watch Video Solution

237. Dissolution of a solute is an exothermic process if:

A. Hydration energy > Lattic energy

B. Hydration energy < Lattic energy

C. Hydration energy=Lattic energy

D. None

Answer: A

Watch Video Solution

238. The boiling point of an azeotropic mixture of water and ethyl alcohol is less than that of theoretical value of water and alcohol mixture. Hence the mixture shows:

A. That solution is highly saturated

B. Positive deviation from Raoul.s law

C. Negative deviation from Raoul. law

D. Nothing can be said

Answer: B

Watch Video Solution

239. Which solution would exhibit abnormal osmotic pressure ?

A. Aqueous solution of urea

B. Aqueous solution of common salt

C. Aqueous solution of glucose

D. Aqueous solution of sucrose

Answer: B

Watch Video Solution

240. Van't Hoff factor(i):

A. Is Less than one in case of dissociation

B. Is more than one in case of association

C. I = normal molecular mass / observed molecular mass

D. I = observed molecular mass / normal molecular mass

Answer: C

Watch Video Solution

241. Acetic acid on dissolution in benzene will show:

A. Two times of its normal molecular weight

B. Its normal molecular weight

C. Half of its normal molecular weight

D. None

Answer: A

Watch Video Solution

242. Which salt shows maximum osmotic pressure in its 1 M solution ?

A. NaCl

B. Na_2SO_4

C. $(NH_4)_3PO_4$

D. $MgCl_2$

Answer: C

Watch Video Solution

243. Solutions distilled without change in composition at a temperature are called:

A. Atmorphous

B. Azeotropic mixture

C. Ideal solution

D. Super saturated solution

Answer: B

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244. To form a super saturated solution of salt one must:

A. Cool slowly

B. Cool rapidly

C. Add some salt to cold solution

D. Use a clear vessel

Answer: B

Watch Video Solution

245. By adding water to the solution, its:

A. Concentration remains same

B. Concentration increase

C. Ionisation decreases

D. Concentration decreases

Answer: D

Watch Video Solution

246. The elevation in boiling point for one molal solution of a solute in a solvent is called:

A. Cryoscopic constant

B. Boiling point constant

C. Molal Elevation constant

D. None

Answer: C

Watch Video Solution

247. Boiling point of a solution is independent of

A. Amount of solution

B. Pressure

C. Nature of solvent

D. Concentration of solution

Answer: A

Watch Video Solution

248. Which solution will show maximum elevation in b.pts:

A. 0.1 M KCl

B. 0.1 M $BaCl_2$

C. 0.1 M $FeCl_3$

D. 0.1 M $Fe_2(SO_4)_3$

Answer: D

Watch Video Solution

249. The solution which show positive or negative deviation from Raoult's law are called:

A. Ideal solutions

B. True solutions

C. Non-ideal solutions

D. Colloidal solutions

Answer: C

Watch Video Solution

250. Which involves osmosis ?

A. Crenation

B. Plasmolysis

C. Haemolysis

D. All

Answer: D

 Watch Video Solution

251. On mixing 10 mL of acetone with 40 ml of chlorofrom, the total volume of the solution is:

A. $< 50ml$

B. $> 50ml$

C. $= 50mL$

D. Cannot be predicted

Answer: A

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252. Solubility of solutes which dissolve with the liberation of heat decreases with:

A. Decrease in temperature

B. Increase in temperature

C. No change in temperature

D. None

Answer: B

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253. Two solutions have different osmotic pressures. The solution of lower osmotic pressure is called:

A. Isotonic solution

B. Hypertonic solution

C. Hypotonic solution

D. None

Answer: C

 Watch Video Solution

254. At high altitudes the boiling point of water decreases because:

A. Atmospheric pressure is low

B. Temperature is low

C. Atmospheric pressure is high

D. None

Answer: A

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255. The vapour pressure of a solution is proportional to:

A. Mole fraction of solute

B. 1/(mole fraction of solute)

C. Mole fraction of solvent

D. None

Answer: C

Watch Video Solution

256. The pressure under which liquid and its vapour can coexist in equilibrium is known as:

A. Normal vapour pressure

B. Saturated vapour pressure

C. Read vapour pressure

D. Limiting vapour pressure

Answer: B

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257. The relative lowering of vapour pressure in case of dilute solutions is directly proportional to :

A. Molality

B. Molarity

C. Mole fraction

D. All

Answer: D

Watch Video Solution

258. The substances whose solubility decreases with increase in temperature :

A. NaOH

B. Na_2CO_3

C. Na_2SO_4

D. All

Answer: D

Watch Video Solution

259. In two solution having different osmotic pressure, the solution of higher osmotic pressure is called :

A. Isotonic solution

B. Hypertonic solution

C. Hypotonic solution

D. None

Answer: B

Watch Video Solution

260. On mixing 10 mL of carbon tetrachloride with 10 mL of benzene the total volume of the solution is:

A. $> 20mL$

B. $< 20mL$

C. $= 20mL$

D. Cannot be predicted

Answer: C

Watch Video Solution

261. The factor $\frac{\Delta T f}{K_f}$ Represents :

A. Molarity

B. Formality

C. Normality

D. Molality

Answer: D

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262. A teacher one day pointed out to his students the peculiar fact that water is unique liquid which freezes exactly at $0^\circ C$ and boils exactly at $100^\circ C$. He asked the students to find the correct statement based on this fact :

A. Water dissolves anything however sparingly the dissolution may be

B. Water is a polar molecule

C. Boiling and freezing temperature of water were used to define a temperature

scale

D. Liquid water is denser than ice

Answer: C

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263. When an ideal binary solution is in equilibrium with its vapour, molar ratio of the two components in the solution and in the vapour phase is:

A. Same

B. Different

C. May or may not be same depending upon volatile nature of the two components

D. All

Answer: C

Watch Video Solution

264. The osmotic pressure of a dilute solution is directly proportional to the:

A. Diffusion rate of the solute

B. Ionic concentration

C. Boiling point

D. Flow of solvent from a concentrated solution

Answer: B

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265. If Raoult's law is obeyed, the vapour pressure of the solution is directly proportional to:

A. Mole fraction of solvent

B. Mole fraction of the solute

C. Mole fraction of the solvent and solute

D. The volume of the solution

Answer: A

 Watch Video Solution

266. Boiling point of water is defined as the temperature at which:

A. Vapour pressure of water is equal to that on one atmospheric pressure

B. Bubbles are formed

C. Steam comes out

D. None

Answer: A

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267. The melting points of most of the solid substances increase with an increase of pressure acting on them. However, ice melts at a temperature lower than its usual meiting point, when the pressure increases. This is because:

A. Ice is less denser than water

B. Pressure generates heat

C. The bonds break under pressure

D. Ice is not a true sold

Answer: A

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

A. $0^\circ C$

B. Above $0^\circ C$

C. $1^\circ C$

D. Below $0^{\circ} C$

Answer: D

Watch Video Solution

269. The solubility of a gas in liquid at a temprature is directly proportional to its:

A. Density

B. Melting point

C. Boiling point

D. Pressure

Answer: D

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270. An example of a solution having liquid in gas is:

A. Moist air

B. Dry air

C. Au-Hg

D. $C_2H_5OH + H_2O$

Answer: A

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271. Camphor is used as solvent to determine molecular weight of non-volatile solute by Rast method because. For camphor:

A. Being cheap

B. High m.pt.

C. Molal depression constant is high

D. None

Answer: C

Watch Video Solution

272. The vapour pressure of water depends upon:

A. Surface area of container

B. Volume of container

C. Temperature

D. All

Answer: C

Watch Video Solution

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

A. Solute only

B. Solvent only

C. BOTH (A) AND (B)

D. None

Answer: B

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274. At low concentrations, the statement that equimolal solutions under a given set of experimental conditions have equal osmotic pressures is true for :

A. All solutions

B. Solutions of non-electrolytes which neither dissociates nor associater

C. Solutions of electrolytes only

D. None

Answer: B

 Watch Video Solution

275. Among the following substances, the lowest vapour pressure is exerted by :

A. Water

B. Mercury

C. Kerosene

D. Rectified spirit

Answer: B

Watch Video Solution

276. Blood cells retain their normal shapes in solutions which are :

A. Isotonic to blood

B. Hypotonic to blood

C. Hypertonic to blood

D. Isoelectronic to blood

Answer: A

Watch Video Solution

277. As a result of osmosis the volume of solution:

A. Remains constant

B. Increases

C. Decreases

D. Increases or decreases

Answer: D

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278. Each pair forms ideal solution except:

A. C_2H_5Br and C_2H_5I

B. C_6H_5Cl and C_6H_5Br

C. C_6H_6 and $C_6H_5CH_3$

D. C_2H_5I and C_2H_5OH

Answer: D

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279. The osmotic pressure (P) of a solution is given by relation:

A. $P = \frac{RT}{C}$

B. $P = \frac{CT}{R}$

C. $P = \frac{RC}{T}$

D. $\frac{P}{C} = RT$

Answer: D

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280. Which statement is incorrect about osmotic pressure (P), volume (V) and temperature (T) ?

A. $P \propto 1/V$ if T is constant

B. $P \propto T$, if V is constant

C. $P \propto V$,if T is constant

D. PV is constant, if T is constant

Answer: C

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281. Solute when dissolved in water:

A. Decreases the vapour pressure of water

B. Increases the boiling point of water

C. Decreases the freezing point of water

D. All of the above

Answer: D

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282. The van.t Hoff factor of NaCl assuming $100\,\%$ dissociation is :

A. 1/2

B. 2

C. 1

D. 3

Answer: B

Watch Video Solution

283. The molal elevation/depression constant depends upon :

A. Nature of solvent

B. Nature of solute

C. Temperature

D. ΔH solution

Answer: A

Watch Video Solution

284. An aqueous solution of methanol on 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

Answer: C

Watch Video Solution

285. The depression in freezing point is maximum if .....is used as solvent .

A. Camphor

B. Naphthalene

C. Benzene

D. Water

Answer: A

Watch Video Solution

286. When mercuric iodide is added to the aqueous solution of potassium iodide the:

A. Freezing point is raised

B. Freezing point is lowered

C. Freezing point does not change

D. Boiling point does not change

Answer: A

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287. The osmotic pressure of a dilute solution is given by :

A. P=$P_0 \times N_1$

B. $\pi V = nRT$

C. $\Delta P = P_0 N_2$

D. $\frac{\Delta P}{P_0} = \frac{P_0 - P_s}{P_o}$

Answer: B

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288. For a dilute solution , Raoult.s law states that:

A. The lowering of vapour pressure is equle to the mole fraction of solute

B. The relative lowering of vapour pressure is equal to the mole fraction of solute

C. The relative lowering of vapour pressure is proportional to the amount of solute in solution

D. The vapour pressure of the solution is equal to the mole fraction of solvent

Answer: B

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289. Which of the following is not a colligative property.

A. Lowering of vapour pressure

B. Freezing point

C. Osmotic pressure

D. Elevation of boiling point

Answer: B

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290. Blood has been found to be isotonic with

:

A. Normal saline solution

B. Saturated NaCl solution

C. Saturated KCl solution

D. Staurated solution of a 1 : 1 mixture of NaCl and KCl

Answer: A

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291. Which condition is not satisfied by an ideal solution:

A. ΔH mixing = 0

B. ΔV mixing = 0

C. ΔS mixing = 0

D. Obeyance of Raoult's law

Answer: C

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292. Isotonic solutions are those which have the:

A. Same osmotic pressure

B. Same molarity

C. Same density

D. Same normality

Answer: A

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293. The correct relationship between the boiling points of very dilute solution of $AlCl_3(t_1)$ and $CaCl_2(t_2)$, having the same molar concentration , as :

A. $t_1 = t_2$

B. $t_1 > t_2$

C. $t_2 > t_1$

D. $t_2 \geq t_1$

Answer: B

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294. Two solutions of KNO_3 and CH_3COOH are prepared separately. Molarity of both is 0.1 M and osmotic pressures are P_1 and p_2

respectively. The correct relationship between the osmotic pressure is :

A. $P_2 > P_1$

B. $P_1 = P_2$

C. $P_1 > P_2$

D. $\frac{P_1}{P_1 + P_2} = \frac{P_2}{P_1 + P_2}$

Answer: C

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295. What will be the molecular weight of NaCl determined experimentally following elevation in the boiling point or depression in freezing point method ?

A. < 58.5

B. > 58.5

C. $= 58.5$

D. None of these

Answer: A

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Watch video solution

296. At a given temperature if P is the vapour pressure of a solution and P_0 that of its pure solvent , the relative lowerning of vapour pressure of the solution is given by :

A. $\frac{P_0 - P}{P_0}$

B. $\frac{P - P_0}{P_0}$

C. $\frac{P_0}{P}$

D. $\frac{P}{P_0}$

Answer: A

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297. The lowering of vapour pressure of a solvent by the addition of a non-volatile solute to it , is directly proportional to :

A. The strength of the solution

B. The nature of the solute in the solution

C. The atmospheric pressure

D. All

Answer: A

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298. A thermometer which can be used only accurate measurement of small differences in temperature is know as a :

A. Beckmann.s thermometer

B. Contact thermometer

C. Clinical thermometer

D. Platinum resistance thermometer

Answer: A

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299. Boiling point elevation is :

A. Additive property

B. Contitutive property

C. Colligative property

D. Partly additive and partly constitutive

Answer: C

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300. 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 one

B. Greater than one

C. One

D. Zero

Answer: B

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301. An example of colligative property is :

A. Freezing point

B. Boiling point

C. Vapour pressure

D. Osmotic pressure

Answer: D

Watch Video Solution

302. A mixture of benzene and toluene forms :

A. An ideal solution

B. Non-ideal solution

C. Suspension

D. Emulsion

Answer: A

Watch Video Solution

303. The colligative properties of a solution depend on :

A. Number of solute particles present in it

B. Chemical nature of the solute particles present in it

C. Nature of the solvent used

D. None

Answer: A

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304. Which of the following methods can not be used to determine the molecular weight of non-volatile solute?

A. Victor Meyer.s method

B. Osmoticpressure method

C. Cryoscopic method

D. Ebullioscopic method

Answer: A

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305. If P_0 and P_δ are the vapour pressure of solvent and solution respectively and N_1 and N_2 are the mole of solute and solvent then:

A. $P_s = P_O n_1$

B. $P_s = P_O n_2$

C. $P_0 = P_s n_2$

D. $P_s = P_0 \dfrac{n_1}{n_2 + n_1}$

Answer: A

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306. Osmosis is the spontaneous flow through a semipermeable membrane of :

A. A less concentrated solution into more in to more concentrated solution

B. The Solvent from a solution of lower concentration to one of higher concentration

C. Solute particles from a solution of higher concentration to one of lower concentration

D. None

Answer: B

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307. The vapour pressure of a dilute solution of a solute is not influenced by :

A. Temperature of solution

B. Melting point of solute

C. Mole fraction of solute

D. Degree of dissociation of solute

Answer: B

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308. The vapour pressure (VP) of a dilute solution of non-volatile solute is P and the VP of pure solvent is P_0 the lowering of the VP is :

A. $+ve$

B. $-ve$

C. $\frac{P}{P_0}$

D. $\frac{P_0}{P}$

Answer: A

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309. The highest temperature at which vapour pressure of a liquid can be measured is :

A. B.pt. of liquid

B. Critical temperature (T)

C. Critical solution temperature

D. Inversion temperature

Answer: B

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310. The value of K_f for water is 1.86 calculated from glucose solution . The value of

K_f for water calculated for NaCl solution will be :

A. $= 1.86$

B. < 1.86

C. > 1.86

D. Zero

Answer: A

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311. 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 was removed

B. Same as what would be if the glass plate was removed

C. Less than what would be if the glass plate was removed

D. Cannot be predicted

Answer: B

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312. The molecular weight of benzoic acid as determined by depression in freezing point method corresponds to :

A. Ionization of benzoic acid

B. Dimerization of benzoic acid

C. Trimerization of benzoic acid

D. Solvation of benzoic acid

Answer: B

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313. The elevation of boiling point method is used for the determination of molecular weight of :

A. Non-volatile and soluble solute

B. Non-volatile and insoluble solute

C. Volatile and soluble solute

D. Volatile and insoluble solute

Answer: A

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314. Sodium sulphate is soluble in water whereas barium sulphate is sparingly soluble because:

A. The hydration energy of sodium sulphate is more than its lattice energy

B. The lattice energy of barium sulphate is less than the hydration energy

C. The lattice energy has no role to play in solubility

D. The hydroation energy of sodium sulphate is less than its lattice energy

Answer: A

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315. Which solute can from saturated solutions in water ?

A. Sodium acetate

B. Hypo

C. Glauber.s salt

D. All

Answer: D

Watch Video Solution

316. Two solutions A and B are separated by seimpereneable membrane . If liquid flows from A and B then :

A. A is more concentrated than B

B. A is less concentrated than B

C. Both solutions have some concentration

D. None

Answer: B

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317. Molal elevation constant of a liquid is :

A. The elevation in b.pt. which would be produced by dissolving one mole of solute in 100 g of solvent

B. The elevation of b.pt. which would be produced by dissolving 1 mole solute in 10 g of solvent

C. Elevation in b.pt. which would be produced by dissolving 1 mole of solute

in 1000 g of solvent

D. None

Answer: C

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318. One mole each of urea, glucose and sodium chloride were dissolved in one litre of water . Equal osmotic pressure will be produced by solutions of :

A. Urea and glucose

B. Sodium chloride and urea

C. Glucose and sodium chloride

D. None

Answer: A

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319. The solubility of a solid in a liquid depends on :

A. Nature of solute

B. Nature of solvent

C. Temperature

D. All

Answer: D

Watch Video Solution

320. Alcohol has ..... Vapour pressure than water at the same temperature :

A. More

B. Less

C. Same

D. None

Answer: A

Watch Video Solution

321. The mixtureof n-hexane and n-heptane is an example of :

A. Ideal solution

B. None-ideal solution

C. Dilute solution

D. Real solution

Answer: A

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322. Define the term solution.

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323. How many types of solutions are formed ?

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324. Name the types of solutions .

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325. Which law governs the dissolution of a gas in a liquid ?

Watch Video Solution

326. Between sea water and drinking water which will freeze at lower temperature?

Watch Video Solution

327. Between sea water and pure water, which boils at a higher temperature ?

Watch Video Solution

328. What is the effect of increase of pressure on the solubility of a gas in liquid ?

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329. In which type of liquid, an ionic solid will go into solution ?

Watch Video Solution

330. Name one factor which influences the solubillity of a gas in a solvent .

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331. What is the effect of pressure on the boilling point of a liquid ?

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332. How does the boiling point of a liquid change with decrease in atmospheric pressure ?

Watch Video Solution

333. Between sea water and drinking water which will freeze at lower temperature?

Watch Video Solution

334. What is the melting point of ice at one atmospheric pressure in Kelvin scale ?

Watch Video Solution

335. Between sea water and pure water, which boils at a higher temperature ?

Watch Video Solution

336. What is Van't Hoff equation for osmotic pressure ?

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337. How ΔT_f is related with molality ?

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338. What is molal elevation constant of a solvent ?

Watch Video Solution

339. Among 1M solution of glucose , NaCl, $FeCl_3$, $CaCl_2$, which one has the (a) highest boiling point (b) lowest boiling point ?

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340. What is an ideal solution ?

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341. What is a colligative property?

Watch Video Solution

342. Which of the following has higher vapour pressure at the same temperature ?

$CH_3OH(BP = 64.5^\circ C)$ and

$C_2H_5OH(BP = 78.3^\circ C$

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343. When temperature increases vapour pressure of liquid –

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344. Solubility of a gas in liquid, ____ with rise of temperature .

Watch Video Solution

345. At the boiling point of a liquid its vapour pressure is equal to _____.

Watch Video Solution

346. Polar solutes are _____ in non-polar solvents .

Watch Video Solution

347. At the boiling point of a liquid its vapour pressure is equal to _____.

348. The vapour pressure of liquid _____ with rise of temperature .

349. Solutions having same osmotic pressure are called _____

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350. On adding a solute, freezing point of solution _____ .

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351. On adding a solute, boiling point of solution _____ .

Watch Video Solution

352. On adding a solute, osmotic pressure _____ .

Watch Video Solution

353. On adding a solute, vapour pressure _____ .

Watch Video Solution

354. With increase of altitude, the boiling point of water _____(increase,decreases,remains same)

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355. Two solutions having same osmotic pressure are called _____ solution .

Watch Video Solution

356. On adding a solute, freezing point of solution _____ .

Watch Video Solution

357. Solubility of a gas in liquid, increases with rise of temperature .

Watch Video Solution

358. At the boiling point of liquid its vapour pressure is greater than atmospheric pressure . Is it true or false?

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359. The vapour pressure of liquid decreases with rise of temperature .(true/false)

Watch Video Solution

360. On adding a solute, vapour pressure increases .(true/false)

Watch Video Solution

361. State henry's law.

Watch Video Solution

362. Define mole fraction .

Watch Video Solution

363. Calculate the molarity when 73 grams of HCl is dissolved in water to make 1500 ml solution.

Watch Video Solution

364. What do you understand by osmotic pressure ?

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365. Define molality. 29.25 gms of NaCl are present in 529.25 gms of solution . Find out the molality .

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366. 5.85 g of NaCl is dissolved in 90 g water what is the mole fraction of NaCl ?

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367. What is the relationship between depression in freezing point of a solution and molecular mass of the solute ?

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368. Compare the osmotic pressures of the following two solution at the same temperature :

1 M Glucose solution

1M barium chloride solution .

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369. Arrange the following in increasing order of their vapour pressure at room temperature. (Water, salt solution in water, alcohol – water solution)

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370. How does the vapour pressure of a liquid change with intermolecular force of attraction ?

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371. In which type of liquid, an ionic solid will go into solution ?

Watch Video Solution

372. What type of change takes place when suger is dissolved in a cup of tea ?

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373. What is freezing point of a liquid ?

Watch Video Solution

374. What is the freezing point of water at 1 atmospheric pressure in kelvin scales ?

Watch Video Solution

375. What is Osmotic pressure ?

Watch Video Solution

376. What is ebullioscopic constant ?

Watch Video Solution

377. Between sea water and pure water, which boils at a higher temperature ?

Watch Video Solution

378. Define osmosis.

Watch Video Solution

379. 15 gm of a substance dissolved in 150 gms of water produces a depression of -1.2° C in the freezing point . Calulation the Mol. Wt. of the solid (K_f for water is 1.86 K kgmol^{-1})

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380. What is the relationship between depression in freezing point of a solution and molecular mass of the solute ?

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381. Why is the boiling point of a solution always higher than that of a pure solvent ?

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382. How would you justify that the relative lowering in vapour pressure is a colligative property ?

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383. Define Van't Hoff laws of Osmotic pressure.

384. Distinguish between diffusion and osmosis.

385. Define Van't Hoff factor.

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386. State and explain Henry's law.

Watch Video Solution

387. Explain the terms, .Molality, Molarity and Molfractions ..

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388. How can you determine the molecular mass of a non-volatile solute from depression of freezing point ?

Watch Video Solution

389. How can you determine the molecular mass of a non-volatile solute from elevation of boiling point ?

Watch Video Solution

390. How can you determine the molecular mass of a non-volatile solute from depression of freezing point ?

Watch Video Solution

391. What is Osmotic pressure ? How will you determine the molecular mass of a substance by this method ?

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392. Explain Vant's Hoff's theory of dilute solution relating to osmotic pressure.

Watch Video Solution

393. Discuss abnormal molecular masses in terms of Vant Hoff factor.

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394. An example of solution is:

A. Amalgam

B. Brass

C. Na in NH_3

D. Dust in air

Answer: B

Watch Video Solution

395. The process of osmosis was discovered by:

A. Pfeffer

B. Traube

C. Berkeley

D. Nollet

Answer: D

Watch Video Solution

396. Who proposed the concept that solute particles in solution behaves like gaseous molecules?

A. Boyle

B. van't Hoff

C. Nollet

D. Charles

Answer: B

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397. Osmotic pressure of non-aqueous solution is measured by:

A. Berkeley and Hartley method

B. Pfeffer's method

C. Morse and Frazer method

D. Townend's method

Answer: D

398. Solubility of deliquescent substances in water is generally:

A. high

B. Low

C. Moderate

D. Can not be said

Answer: A

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399. The boiling point of $C_6H_6, CH_3OH, C_6H_5NH_2$ and $C_6H_5NO_2$ are $80^\circ C, 65^\circ C, 184^\circ C,$ and $212^\circ C$

respectively. Which will show highest vapour pressure at room temperature?

A. C_6H_6

B. CH_3OH

C. $C_6H_5NH_2$

D. $C_6H_5NO_2$

Answer: B

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400. Binary liquid solutions which exhibit positive deviations from Raoult's law boil at temperature.....than the expected boiling point.:

A. Lower

B. Higher

C. Same

D. Can not be said

Answer: B

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401. A pressure cooker reduces cooking time because:

A. Heat is more evenly distributed

B. B.pt.of water inside the cooker is increased

C. The high pressure tenderises the food

D. All

Answer: B

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402. Waterwill boil at $101.5^{\circ} C$ at which of the XT- following pressure:

A. 76 m of Hg

B. 76 mm of Hg

C. gt76 cm of Hg

D. lt76 cm of Hg

Answer: C

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403. Binary liquid solutions which exhibit positive deviations from Raoult's law boil at temperature.....than the expected boiling point.:

A. Lower

B. Higher

C. Same

D. can not be said

Answer: A

Watch Video Solution

404. Which solution will show the maximum vapour pressure at 300 K ?

A. 1 M NaCl

B. 1 M $CaCl_2$

C. 1 M CH_3COOH

D. 1 M $C_{12}H_{22}O_{11}$

Answer: D

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405. The van't Hoff factor (i) for a dilute aqueous solution of glucose is:

A. Zero

B. 1

C. 1.5

D. 2

Answer: B

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406. Which pair shows a contractions in volume on mixing ?

A. $CHCL_3 + C_6H_6$

B. H_2O + HCL

C. $H_2O + HNO_3$

D. All

Answer: D

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407. If P_0 and P_δ are the vapour pressure of solvent and solution respectively and N_1 and N_2 are the mole of solute and solvent then:

A. $\frac{P_0 - P_\delta}{P_0} = \frac{N_1}{N_1 + N_2}$

B. $\frac{P_0 - P_\delta}{P_\delta} = \frac{N_1}{N_2}$

C. $P_\delta = P_0 . \frac{N_2}{N_1 + N_2}$

D. All

Answer: D

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408. Which characterises the weak intermolecular forces of attraction in a liquid ?

A. High boiling point

B. High vapour pressure

C. High critical temperature

D. High heat of vaporisation

Answer: B

409. The phenomenon in which cells are swelled up and then burst if placed in hypotonic solutions is called:

A. Plasmolysis

B. Haemolysis

C. Exosmosis

D. None

Answer: B

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410. The phenomenon in which cells are swelled up and then burst if placed in hypotonic solutions is called:

A. Plasmolysis

B. Haemolysis

C. Endosmosis

D. None

Answer: A

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411. Equimolal solutions will have the same elevation in boiling point, provided they do not show:

A. Electrolysis

B. Association

C. Dissociation

D. Association or dissociation

Answer: D

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412. The depression in freezing point is directly proportional to:

A. Normality

B. Molality

C. Molarity

D. None

Answer: B

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413. Pick out the combination which show positive deviations from Raoult.s law:

A. $C_2H_5OH + \mathbb{C}L_4$

B. $H_2O + CH_2CH_2CH_2OH$

C. $C_2H_5OH + CHCL_3$

D. All are correct

Answer: D

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414. If mole fraction of the solvent in a solution decreases then:

A. Vapour pressure of solution increases

B. B.pt. decreases

C. Osmotic pressure increases

D. All are correct

Answer: C

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415. In which of the following the van.t Hoff Factor (i) is equal to one ?

A. NaCl

B. KNO_3

C. Urea

D. All

Answer: C

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416. A maxima or minima obtained in the temperature, composition curve of a mixture of two liquids indicates:

A. An azeotropic mixture

B. An eutectic formation

C. That the liquids are immiscible with one another

D. That the liquids are partially miscible at the maximum or minimum

Answer: A

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417. When the vapour pressure of solutions of two liquids are less than those expected from idea solutions, they are said to show:

A. Positive deviation from idea behaviour

B. Negative deviation from idea behaviour

C. Positive deviations for lower concentrations and negative deviations for higher concentration

D. None

Answer: B

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418. The natural semipermiable membrane is:

A. Gelatinous $Cu_2Fe(CN)_6$

B. Gelatinous $Ca_3(PO_4)_2$

C. Plant cell

D. Phenol layer

Answer: C

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419. 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

Answer: C

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420. Just after slow crystallisation the solution in contact with the crystal is:

A. Dilute

B. Unsaturated

C. Saturated

D. Super saturated

Answer: D

Watch Video Solution

421. The van't Hoff factor (i) for a dilute solution of $K_3\left[Fe(CN)_6\right]$ is:

A. 10

B. 4

C. 5

D. 0.25

Answer: B

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422. Which of the following 0.1 M aqueous solutions will have the lowest freezing point :

A. Potassium sulphate

B. Sodium chloride

C. Urea

D. Glucose

Answer: A

Watch Video Solution

423. Which compound corresponds van.t Hoff factor (i) to be equal to 2 in dulite solution?

A. K_2SO_4

B. $NaHSO_4$

C. Sugar

D. $MgSO_4$

Answer: D

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424. The plant cells will shrink when placed in

A. Water

B. A hypotonic solution

C. A hypertonic solution

D. An isotonic solution

Answer: C

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425. A solution of sulphuric acid in water exhibits:

A. Negative deviations from Raoult's law

B. Positive deviations from Raoult's law

C. Idea properties

D. The applicability of Henry's law

Answer: A

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426. A substance will be deliquescent if its vapour pressure is:

A. Equal to the atmospheric pressure

B. Equal to that of water vapourin the air

C. Greater than that of water vapour in the air

D. Lesser than that of water vapour in the air

Answer: D

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427. The process of getting freshwater from sea water is known as:

A. Osmosis

B. Filtration

C. Diffusion

D. Reverse Osmosis

Answer: D

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428. Saturated solution of NaCl on heating becomes:

A. Super saturated

B. Unsaturated

C. Remains saturated

D. None

Answer: B

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429. A super saturated solution is a metastable state of solution in which solute concentration:

A. Is equal to the solubility of that substance in water

B. Exceeds than its solubility

C. Less than its solubility

D. Continuously change

Answer: B

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430. The molal cryoscopic constant for water is:

A. 1.86 K $molality_{-1}$

B. 5.26 K $molality_{-1}$

C. 55.5 K $molality_{-1}$

D. 0.52 K $molality_{-1}$

Answer: A

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431. An aqueous solution is heated until it begins to boil. The atmospheric pressure is 760 mm of Hg. The boiling temperature will be:

A. $100^\circ C$

B. $> 100^\circ C$

C. $< 100^\circ C$

D. None

Answer: B

Watch Video Solution

432. The spontaneous movement of solute particles from a more concentrated solution to less concentrated solution is called:

A. Osmosis

B. Diffusion

C. Plasmolysis

D. Fusion

Answer: B

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433. At a suitable pressure near the freezing point of ice, there exists:

A. Only ice

B. Ice and water

C. Ice and steam

D. Ice, water and steam, all existing side by side

Answer: D

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434. A liquid is in equilibrium with its vapours at its boiling point. On the average the molecules in the two phases have equal:

A. Potential energy

B. Total energy

C. Kinetic energy

D. Intermolecular forces

Answer: C

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435. In the case of osmosis, solvent molecules move from:

A. Higher vapour pressure to lower vapour pressure

B. Higher concentration to lower concentration

C. Lower vapour pressure to higher vapour pressure

D. Higher osmotic pressure to lower osmotic pressure

Answer: A

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436. If molecular interaction between two different liquid molecules are stronger than the molecular interactions between the pure liquid molecules, the mixture is expected to show:

A. Positive deviations

B. Negative deviations

C. No Deviations

D. Positive as well as negative deviations

Answer: B

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437. The ratio of the value of any colligative property for KCl solution to that of sugar solution is:

A. 1

B. 0.5

C. 2

D. 4

Answer: C

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438. One the basis of intermolecular forces predict the correct order of decreasing boiling to that of sugar solution is:

A. $CH_3OH > H_2 > CH_4$

B. $CH_3OH > CH_4 > H_2$

C. $CH_4 > CH_3OH > H_2$

D. $H_2 > CH_4 > CH_3OH$

Answer: B

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439. If the temperature increases from $0^\circ C$ to $50^\circ C$ at atmospheric pressure, which of the

following processes is expected to take place more in case of liquids ?

A. Fusion

B. Vaporisation

C. Solubilization

D. None

Answer: B

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440. The reverse of fusion is freezing and it is:

A. Endothermic

B. Exothermic

C. Neither exothermic nor endothermic

D. May be exothermic or endothermic

Answer: B

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441. The most suitable method for the detemination of molecular weight of oxyhaemoglobin, a compound of high molecular weight is:

A. Osmotic pressure method

B. Vapour pressure lowering method

C. Elevation of boiling point mehod

D. None

Answer: A

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442. Which salt may show the same value of van't Hoff factor (i) as that of $K_4Fe(CN)_6$ in very dilute solution state ?

A. $Al_2(SO_4)_3$

B. NaCl

C. $Al(NO_3)_3$

D. Na_2SO_4

Answer: A

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443. The lubricating action of an oil is more if it possess:

A. High vapour pressure

B. Low vapour pressure

C. High surface tension

D. High density

Answer: B

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444. Generally those gases are soluble in water to a greater extent which:

A. Are easily liqefied

B. Are ionsed in water

C. React with water

D. All are correct

Answer: D

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445. The energy that favours dissolution of a solute in water is known as:

A. Hydration energy

B. Lattice energy

C. Ionisation energy

D. Exothermic energy

Answer: A

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446. The energy that opposes the dissolution of a solute in a solvent is called:

A. Solvent energy

B. Hydration energy

C. Lattice energy

D. Ionisation energy

Answer: C

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447. For an ideal binary liquid solution with $P_A^\circ > P_B^\circ$ which relation between X_A (mole fraction of A in liquid phase) and Y_A (mole fraction of A in vapour phase) is correct, X_B and Y_B are mole fraction of B in liquid and vapour phase respectively

A. $X_A = Y_A$

B. $X_A > Y_A$

C. $\frac{X_A}{X_B} < \frac{Y_A}{Y_B}$

D. X_A, Y_A, X_B and Y_B cannot be corelated

Answer: C

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448. What is semipermeable membrane?

A. Calcium phosphate (gelatinous)

B. Phenol layer

C. Copper ferrocyanide (gelatinous)

D. All

Answer: D

Watch Video Solution

449. In cold countries, ethylene glycol is added to water in the radiators of cars during winters. It results in:

A. Lowering in boiling point

B. Reducing viscosity

C. Reducing specific heat

D. Lowering in freezing point

Answer: D

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450. Beckmann's thermometer are used to measures:

A. Boiling point of the solution

B. Freezing point of the solution

C. Any temperature

D. Elevation in boiling point or depression in freezing point

Answer: D

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451. Equimolal solutions of A and B show depression in freezing point in the ratio 2 : 1. A remains in its normal state in solutions. B will be in solution:

A. Normal

B. Dissociated

C. Associated

D. Hydrolysed

Answer: C

 Watch Video Solution

452. The vapour pressure of a solution of a non-volatile electrolyte (B) in a solvent (A) is $95\,\%$ of the vapour pressure of the solvent at the same temperature. If the molecular weight of the solvent is 0.3 times the molecular

weight of solute, the weight ratio of the solvent and solute are:

A. 0.12

B. 5.7

C. 0.2

D. 4

Answer: B

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453. The plots of $\frac{1}{X_A} vs, \frac{1}{Y_A}$ (where X_A and Y_A are the mole fraction of liquid A in liquid and vapour phase respectively) is linear slope and intercepts respectively:

A. $\frac{P_A^\circ}{P_B^\circ}$ and $\frac{P_A^\circ - P_B^\circ}{P_B^\circ}$

B. $\frac{P_A^\circ}{P_B^\circ}$ and $\frac{P_B^\circ - P_A^\circ}{P_B^\circ}$

C. $\frac{P_B^\circ}{P_A^\circ}$ and $\frac{P_A^\circ - P_B^\circ}{P_B^\circ}$

D. P_B° / P_A° and $\frac{P_B^\circ - P_A^\circ}{P_B^\circ}$

Answer: B

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454. Which aqueous solution has minimum freezing point ?

A. 01 M NaCl

B. 0.005 MC_2H_5OH

C. 0.005 M Mgl_2

D. 0.005 M $MgSO_4$

Answer: A

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455. Which solution will have the highest boiling point ?

A. 1% glucose in water

B. 1% sucrose in water

C. 1% NaCl in water

D. 1% $CaCl_2$ in water

Answer: C

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456. Which has maximum freezing point ?

A. 1 molar NaCl solution

B. 1 molar KCl solution

C. 1 molar $CaCl_2$ solution

D. 1 molar urea solution

Answer: C

Watch Video Solution

457. Which solution will have least vapour pressure ?

A. 0.1 M $BaCl_2$

B. 0.1 M urea

C. 0.1 M Na_2SO_4

D. 0.1 M Na_2PO_4

Answer: D

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

A. $BaCl_2$ gt NaCl gt glucose

B. Glucose gt NaCl gt $BaCl_2$

C. NaCl gt $BaCl_2$ gt glucose

D. NaCl gt glucose gt $BaCl_2$

Answer: A

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459. The lowering of vapour pressure of 0.1M aqueous solutions of NaCl, $CuSO_4$, and K_2SO_4 are:

A. All equal

B. In the ratio of 1 : 1 : 1.5

C. In the ration of 3 : 2 : 1

D. In the ration of 1.5 : 1 : 2.5

Answer: B

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460. Which has maximum freezing point ?

A. 1 molar of NaCl solution

B. 1 molar of KCl solution

C. 1 molar of $CaCl_2$ solution

D. 1 molar of urea solution

Answer: D

Watch Video Solution

461. Which solution will produce maximum elevation in b.pt. ?

A. 0.1 M glucose

B. 0.1 M sucrose

C. 0.1 M $BaCl_2$

D. 0.1 M $MgSO_4$

Answer: C

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462. Which has the highest freezing point at one atmoshpere ?

A. 0.1 M NaCl solution

B. 0.1 M sugar solution

C. 0.1 M $BaCl_2$ solution

D. 0.1 M $FeCl_3$ solution

Answer: B

Watch Video Solution

463. The ration of the value of any colligative property for KCI solution to that for sugar solution is nearly .....times

A. 1

B. 0.5

C. 2

D. 2.5

Answer: C

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464. One mole on non-volatile solute is dissolved in two mole of water. The vapour pressure of the solution relative to that of water is:

A. 2/3

B. 1/3

C. 1/2

D. 3/2

Answer: A

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465. A solution has an osmotic pressure of 0.821 atm at 300 K. Its concentration would be:

A. 0.033 M

B. 0.66 M

C. 0.033 M

D. 0.33 M

Answer: C

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466. 5% (wt./vol.) aqueous NaCl solution and 5% (wt./vol.) aqueous KCl solution are:

A. Isotonic

B. Isomolar

C. Isoequimolar

D. None

Answer: D

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467. 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.

A. $5.43\ \%$

B. $3.54\ \%$

C. $4.53\ \%$

D. $53.4\ \%$

Answer: A

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468. The osmotic pressure of a 5% (wt./vol.) solution of cane sugar(mol.wt is 342) at $15^{\circ}C$ is:

A. 4 atm

B. 3.4 atm

C. 5.078 atm

D. 2.45 atm

Answer: C

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469. The freezing points of a 0.05 molal solution of a non-electrolyte in water is: (K, = 1.86 K $molality^{-1}$)

A. $-1.86^{\circ}C$

B. $-0.93^{\circ}C$

C. $-0.93^{\circ}C$

D. $0.093^{\circ}C$

Answer: C

Watch Video Solution

470. The freezing point of 1 molar NaCl solution assuming NaCl to be $100\,\%$ dissociated in water is: (K_f = 1.86 K $molality^{-1}$)

A. $-1.86^\circ C$

B. $-3.72^\circ C$

C. $+1.86^\circ C$

D. $+3.72^\circ C$

Answer: B

Watch Video Solution

471. The molal freezing point constant of water is $-1.86 Kmolality^{-1}$. If 171g of cane sugar ($C_{12}H_{22}O_{11}$) are dissolved in 500 g of water, the solution will freeze at:

A. $-1.86^{\circ}C$

B. $1.86^{\circ}C$

C. $-3.92^{\circ}C$

D. $2.42^{\circ}C$

Answer: A

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472. Osmotic pressure of a solution containing 0.1 mole of solute per litre at 273 K is:

A. $\frac{0.1}{1} \times 0.08205 \times 273$ atm

B. $0.1 \times 2 \times 0.08205 \times 273$ atm

C. $\frac{1}{0.1} \times 0.08205 \times 273$ atm

D. $\frac{0.1}{1} \times \frac{273}{0.08205} \times 273$ atm

Answer: A

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473. Osmotic pressure of 40% (wt./vol.) urea solution is 1.64 atm and that of 3.42% (wt./vol.) cane sugar is 2.46 atm. When equal volumes of the above two solutions are mixed, the osmotic pressure of the resultng solution is:

A. 1.64 atm

B. 2.46 atm

C. 4.10 atm

D. 2.05 atm

Answer: D

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474. Following solutions at the same temperature will be isotonic:

A. 3.42 g of cane sugar in one litre water and 0.18 g of glucose in one litre water

B. 3.42 g of cane sugar in one litre water and 0.18 g of glucose in 0.1 litre water

C. 3.42 g of cane sugar in one litre water and 0.585 g of NaCl in one litre water

D. 3.42 g of cane sugar in one litre water and 1.17 g of NaCl in one litre water

Answer: B

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475. Molal depression of freezing point of water is $1.86^{\circ} C$ per 1000 g of water. 0.02 mole of urea dissolved in 100 g of water will produce a lowering of temperature of:

A. 0.186°

B. 0.372°

C. 1.86°

D. 3.72°

Answer: B

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476. Dry air was passed successively through a solution of 5 g of a solute in 180 g of water and then through pure water. The loss in weight of solution was 2.50 g and that of pure solvent 0.04 g The molecular weight of the solute is:

A. 31.25

B. 3.125

C. 312.5

D. None

Answer: A

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477. The osmotic pressure of decimolar solution of glucose at $30^{\circ} C$ is:

A. 24.88 atm

B. 2.488 atm

C. 248.8 atm

D. None

Answer: B

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478. Osmostic pressure of a solution (density is 1 g/ml) containing 3 g of glucose (molecular weight =180) in 6o g of water at $15^{\circ}C$ is:

A. 0.34 atm

B. 0.65 atm

C. 6.25 atm

D. 5.57 atm

Answer: C

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479. What would be the freezing point of aqueous solution containing 17 g of C_2H_5OH in 1000 g of water K_f = 1.86 K $molality^{-1}$:

A. $-0.69^\circ C$

B. $-0.34^{\circ} C$

C. $0.0^{\circ} C$

D. $0.34^{\circ} C$

Answer: A

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480. A solution containing 8.6 g urea in one litre was found to be isotonic with a 5% (wt./vol.) solution of an organic non-volatile solute. The molecular weight of latter is:

A. 3.48.9

B. 34.89

C. 3489

D. 861.2

Answer: A

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481. 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 $27^{\circ}C$. The molecular weight of solute is:

A. 14.97

B. 149.7

C. 1697

D. 1.497

Answer: B

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482. A solution of 1.25 g of a non-electrolyte in 20 g of water freezing at 271.9K with its molal depression constant , then the molecular wt. of the solute is:

A. 207.8 g/mol

B. 179.79 g/mol

C. 209.6 g/mol

D. 109.6 g/mol

Answer: D

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483. The molal elevation constant of water = 0.52 K, $molality^{-1}$. The boiling point of 1.0 molal aqueous KCl solution (assuming complete dissociation of KCl), should be:

A. $100.52^{\circ}C$

B. $101.04^{\circ}C$

C. $99.48^{\circ}C$

D. $98.96^{\circ}C$

Answer: B

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484. In a solution of 7.8 g benzene (C_6H_6) and 46.0 g toluene ($C_6H_5CH_3$) the mole fraction of benzene is:

A. 1/6

B. 1/5

C. 1/2

D. 1/3

Answer: A

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485. If a 6.84% (wt/vol.) solution of cane sugar (mol.wt.=342) is isotonic with 1.52% (wt/vol.) solution of thiocarbamide, then the molecular weight of thiocarbamide is:

A. 152

B. 76

C. 60

D. 180

Answer: B

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486. The normal amount of glucose in 100 mL of blood (8-12hours after a meal) is:

A. 8 mg

B. 80 mg

C. 200 mg

D. 800 mg

Answer: B

Watch Video Solution

487. Osmotic pressure of a sugar solution at $24^{\circ} C$ is 2.5 atmosphere. The concentration of the solution in mol per litre is:

A. 10.25

B. 1.025

C. 1025

D. 0.1025

Answer: D

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488. At $40^\circ C$ the vapour pressures of pure liquids, benzene and toluene, are 160 mm Hg and 60 mm Hg respectively. At the same temperature, the vapour pressure of an

equimolar solution of the two liquids, assuming the ideal solution should be:

A. 140 mm Hg

B. 110 mm Hg

C. 220 mm Hg

D. 100 mm Hg

Answer: B

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489. Elevation in boiling point was $0.52^{\circ}C$ when 6 g. of a compound X was dissolved in 100 g of water. Molecular weight of X is-

A. 120

B. 60

C. 180

D. 342

Answer: B

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490. 1 litre of a solution containing 500 g of a protein exerts an osmotic pressure of 0.82 atm at $27^{\circ}C$.The molecular weight of the protein is:

A. 82000

B. 50000

C. 41000

D. 15000

Answer: D

Watch Video Solution

491. The concentration of glucose (in g/litre)solution which is isotonic with a solution of urea containing 6 g per litre will be:

A. 6

B. 34.2

C. 18

D. 1.8

Answer: C

Watch Video Solution

492. A solution containing 1 mole of ethylene glycol dissolved in 1000 g of water $\left(K_f = 1.86 Kmolality^{-1}\right)$ will freez at:

A. $-5.2^\circ C$

B. $-0.52^\circ C$

C. $-18.6^\circ C$

D. $-1.86^\circ C$

Answer: C

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493. Solute A is a ternary electrolyte and solute B is non-electrolyte. If 0.1 M solution of solute B produces an osmotic pressure of 2P, then 0.05 M solution of A at the same temperature will produce an osmatic pressure equal to:

A. P

B. 1.5P

C. 2P

D. 3P

Answer: D

 Watch Video Solution

494. The molal elevation constant for water is 0.52 $K.molality^{-1}$. The elevation caused in the boiling point of water by dissolving 0.25

mole of a non-volatile solute in 250 g of water will be:

A. $52^{\circ} C$

B. $5.2^{\circ} C$

C. $0.52^{\circ} C$

D. $0.052^{\circ} C$

Answer: C

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495. A $3.42\ \%$ (wt./vol.) solution of cane suger is isotonic with a $5.96\ \%$ (wt./vol.) solution of raffinose. The molecular weight of raffinose is:

A. 59.6

B. 596

C. 5.96

D. 5960

Answer: B

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496. At $27^{\circ}C$, the osmotic pressure of a solution containing 4.0 g solute (molar mass = 246) per litre at $27^{\circ}C$ is : R = 0.0821 atms. mol^{-1}k)

A. 0.1 atm

B. 0.4 atm

C. 0.2 atm

D. 0.8 atm

Answer: C

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497. The vapour pressure of benzene at $80^{\circ}C$ is lowered by 10mm by dissoving 2gof a non-volatile substance in 78g of benzene The vapour pressure of benzene at $80^{\circ}C$ is 750 mm. The molecular weight of the substance will be:

A. 15

B. 150

C. 1500

D. 148

Answer: D

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498. The mole fraction of water in a solution containing 50 g of water and 50 g of ethyl alcohol is:

A. 50/(50+50)

B. 18/(18+46)

C. 1.09/(1.09+2.78)

D. 2.78/(1.09+2.78)

Answer: D

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499. Which compound corresponds van.t Hoff factor (i) to be equal to 2 in dulite solution?

A. K_2SO_4

B. $NaHSO_4$

C. Sugar

D. $MgSO_4$

Answer: D

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500. 6 g urea is dissolved in 90 g water. The relative lowering of vapour pressure is equal to:

A. 0.0196

B. 0.06

C. 1.1

D. 0.0202

Answer: A

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501. What is the molality of ethyl alocohol (mol. Wt. = 46) in aqueous solution which freezes at $-10^{\circ}C$: (K_f for water = 1.86 K $molality^{-1}$)

A. 3.54

B. 4.567

C. 5.376

D. 6.315

Answer: C

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502. The vapour pressure of benzene at $90^\circ C$ is 1020 torr. A solution of 5 g of a solute in 58.5

g benzene has vapour pressure 990 torr. The molecular weight of the solute is:

A. 78.2

B. 178.2

C. 206.2

D. 220

Answer: D

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503. The vapour pressures 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:

A. 0.467

B. 0.502

C. 0.513

D. 0.556

Answer: C

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504. Y g of non-volatile organic substance of molecular mass M is dissolved in 250 g benzene. Molal elevation constant of benzene is K_b. Elevation in its boiling point is given by:

A. $\frac{M}{K_bY}$

B. $\frac{4K_By}{M}$

C. $\frac{K_bY}{4M}$

D. $\frac{K_b Y}{M}$

Answer: B

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505. The values of observed and calculated molecular weights of silver nitrate are 92.64 and 170 respectively. The degree of dissociation of silver nitrate is:

A. $60\ \%$

B. $83.5\ \%$

C. $46.7\ \%$

D. $60.23\ \%$

Answer: B

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506. One molar solution of sodium chloride will have the relative lowering of vapour pressure closest to:

A. 5.8% (wt//vol.) urea solution

B. 5.8% (wt//vol.) glucose solution

C. 1.0 M glucose solution

D. 2.0 M urea solution

Answer: D

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507. At $88^{\circ}C$ 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 $88^{\circ}C$ at 1 atm pressure, benzene toluene form an ideal solution:

A. 0.416

B. 0.588

C. 0.688

D. 0.74

Answer: D

Watch Video Solution

508. The amount of urea to be dissolved in 500mL of water (K=18.6 K mol^{-1} 100 g solvent) to produce a depression of $0.186^{\circ}C$ in freezing point is:

A. 0.3 g

B. 3 g

C. 6 g

D. 9 g

Answer: B

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509. The molal boiling point constant of water is $0.53^\circ C$. When 2 mole of glucose are dissolved in 4000 g of water, the solution will boil at:

A. $100.53^\circ C$

B. $101.06^\circ C$

C. $100.265^\circ C$

D. $99.47^\circ C$

Answer: C

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510. The freezing point of equimolal aqueous solution will be highest for:

A. $C_6H_5NH_3Cl$

B. $Ca(NO_3)_2$

C. $LA(NO_3)_3$

D. $C_6H_{12}\_O_6$

Answer: D

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511. A solution containing 500 g of a protein per litre is isotonic with a solution containing 3.42 g of sucrose per litre. The molecular mass of protein is:

A. 5

B. 146

C. 34200

D. 50000

Answer: D

 Watch Video Solution

512. The molecular weight of NaCl determined by studying freezing point depression of its 0.5% aqueous solution is 30. The apparent degree of dissociation of NaCl is:

A. 0.95

B. 0.5

C. 0.6

D. 0.3

Answer: A

Watch Video Solution

513. The osmotic pressure of a solution at $0^{\circ} C$ is 2 atm. What will be its osmotic pressure at $273^{\circ} C$ under similar conditions:

A. 0.5 atm

B. 2×273 atm

C. 4 atm

D. $273/2$ atm

Answer: C

Watch Video Solution

514. The relative lowering of vapour pressure produced by dissolving 71.5 g of a substance in 1000 g of water is 0.00713. The molecular weight of the substance will be:

A. 180

B. 18

C. 342

D. 60

Answer: A

 Watch Video Solution

515. The vapour pressure of two pure liquids (A) and (B) are 100 and 80 torr respectively. The total pressure of solution obtained by

mixing 2 mole of (A) and 3 mole of (B) would be:

A. 120 torr

B. 36 torr

C. 88 torr

D. 180 torr

Answer: C

Watch Video Solution

516. A solution containing 4 g of polyvinyl chloride in 1 litre of dioxane was found to have an osmotic pressure of 6×10^{-4} atm at 300 K. The molecular mass of the polymer is:

A. 3×10^{3}

B. 1.6×10^{5}

C. 5×10^{4}

D. 6.4×10^{2}

Answer: B

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517. The depression in f.pt of 0.01 m aqueous solution of urea, sodium chloride and sodium sulphate is in the ratio:

A. 1 : 1 : 1

B. 1 : 2 : 3

C. 1 : 2 : 4

D. 2 : 2 : 3

Answer: B

Watch Video Solution

518. The values of observed and calculated molecular weights of calcium nitrate are respectively 65.6 and 164 . The degree of dissociation of calcium nitrate will be:

A. $25\ \%$

B. $50\ \%$

C. $75\ \%$

D. $60\ \%$

Answer: C

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519. A 5.8% (wt/vol.)NaCl solution will exert an osmotic pressure closest to which one of the following:

A. 5.8% (wt/vot.) sucrose solution

B. 5.8% (wt/vot.) glucose solution

C. 2 molal sucrose solution

D. 1 molal glucose solution

Answer: C

Watch Video Solution

520. 20 g of a binary electrolyte (mol. Wt. = 100) are dissolved in 500 g of water. The freezing point of the solution is $-0.74^{\circ}C$, K = 1.86 k $molality^{-1}$. The degree of ionization of the electrolyte is:

A. $50\ \%$

B. $75\ \%$

C. $100\ \%$

D. Zero

Answer: D

Watch Video Solution

521. The relationship between osmotic pressure at 273 K when 10 g glucose (P_1), 10 g urea (P_2) and 10 g sucrose (P_3) are dissolved in 250 ml of water is:

A. $P_1 > P_2 > P_3$

B. $P_3 > P_1 > P_2$

C. $P_2 > P_1 > P_3$

D. $P_2 > P_3 > P_1$

Answer: C

Watch Video Solution

522. van.t Hoff factor of very dilute solution of $Ca(NO_3)_2$ is:

A. 1

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

523. Lowering in vapour pressure is the highest for:

A. 0.2 m Urea

B. 0.1 m Glucose

C. $0.1mMgSO_4$

D. 0.1 m $BaCl_2$

Answer: D

Watch Video Solution

524. Azeotropic mixture of HCl and water has:

A. 84% HCl

B. 22.4% HCl

C. 63% HCl

D. 20.2% HCl

Answer: D

Watch Video Solution

525. What will be the molality of a solution having 18g glucose (m.wt. = 180) dissolved in 500 g of water:

A. 1 m

B. 0.5 m

C. 0.2 m

D. 2 m

Answer: C

Watch Video Solution

526. Which of the following will have the highest boiling point at 1 atm pressure:

A. 0.1 M NaCl

B. 0.1 M Sucrose

C. 0.1 M $BaCl_2$

D. 0.1 M Glucose

Answer: C

Watch Video Solution

527. An ideal solution was obtained by mixing methanol and ethanol. If the partial vapour pressure of methanol and ethanol are

$2.619KP_a$ and $4.556KP_a$ respectively, the composition of vapour (in terms of mole fraction) will be:

A. 0.625 MeOH, 0.365 EtOH

B. 0.365 MeOH, 0.635 EtOH

C. 0.574 MeOH, 0.326 EtOH

D. 0.173 MeOH, 0.827 EtOH

Answer: B

 Watch Video Solution

528. An aqueous solution freezes at $-0.186^{\circ}C\left(K_f = 1.86^{\circ} : K_b = 0.512^{\circ}\right)$. What is the elevation in boiling point:

A. 0.186

B. 0.512

C. 0.512/1.86

D. 0.0512

Answer: D

Watch Video Solution

529. 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 decrease in vapour pressure is 20 mm of Hg:

A. 0.8

B. 0.6

C. 0.4

D. 0.2

Answer: B

Watch Video Solution

530. Molal depression constant for water is $1.86^\circ C$. The freezing point of a 0.05 molal solution of a non electrolyte in water is:

A. $-1.86^\circ C$

B. $-0.93^\circ C$

C. $0.093^\circ C$

D. $0.93^\circ C$

Answer: C

Watch Video Solution

531. The freezing point of a solution prepared from 1.25 g of non-electrolyte and 20 g of water is 271.9 K. If molar depression constant is 1.86 K mol^{-1} then molar mass of the solute will be:

A. 105.7

B. 106.7

C. 115.3

D. 93.9

Answer: A

Watch Video Solution

532. A 5% solution of cane sugar (M. wt = 342) is isotonic with 1% solution of substance X. The molecular weight of X is:

A. 171.2

B. 68.4

C. 34.2

D. 136.2

Answer: B

Watch Video Solution

533. The amount of ice that will separate out on cooling a solution containing 50 g of ethylene glycol in 200 g water to $-9.3^{\circ}C$ is:

$\left(K_f = 1.86 Kmolality^{-1}\right)$

A. 38.71 g

B. 37.71 mg

C. 42 g

D. 42 mg

Answer: A

 Watch Video Solution

534. A 0.2 molal aqueous solution of a weak acid (HX) is 20 percent ionised. The freezing

point of this solution is: (K_f = 1.86 K/m for water)

A. $-0.45^\circ C$

B. $-0.90^\circ C$

C. $-0.31^\circ C$

D. $-0.53^\circ C$

Answer: A

Watch Video Solution

535. The following aqueous solution in the correct order of decreasing freezing points is:

A. $0.2MBaCl_2, 0.2MKCl, 0.1MNa_2SO_4$

B. $0.2MKCl, 0.1MNa_2SO_4, 0.2MBaCl_2$

C. $0.1MNa_2SO_4, 0.2MKC1, 0.2MBaCl_2$

D. $0.1MNa_2SO_4, 0.2MBaCl_2, 0.2MKCl,$

Answer: C

Watch Video Solution

536. Insulin $(C_2H_{10}O_5)_n$ is dissolved in a suitable solvent and osmotic pressure (π) of solutions of various concentrations $\left(gcm^{-3}\right)$ C is measured at $20^\circ C$. The slope of a plot of π against C is found to be 4.65×10^{-3}. The molecular weight of the insulin is:

A. 4.8×10^5

B. 9×10^5

C. 3×10^5

D. 5.16×10^6

Answer: D

Watch Video Solution

537. At $40^\circ C$ the vapour pressures in torr, of methyl alcohol ethyl alcohol solutions is represented by the equation. $P = 119X_A + 135$, where X_A is mole-fraction of methyl alcohol, then the value of $\lim_{X_{A \to 1}} \frac{P_A}{X_A}$ is:

A. 254 torr

B. 135 torr

C. 119 torr

D. 140 torr

Answer: A

Watch Video Solution

538. The boiling point of an aqueous solution of a nonvolatile solute is $100.15^{\circ}C$. What is the freezing point of an aqueous solution obtained by diluting the above solution with

an equal volume of water? The value of K_b and K_f for water are $0.512^\circ C$ and $1.86^\circ C$ K $molality^{-1}$:

A. $-0.544^\circ C$

B. $-0.512^\circ C$

C. $-0.272^\circ C$

D. $-1.86^\circ C$

Answer: C

Watch Video Solution

539. The freezing point of aqueous solution that contains 5% by mass urea, 1.0% by mass KCl and 10% by mass of glucose is: $\left(K_f H_2O = 1.86 K molality^{-1}\right)$:

A. 290.2 K

B. 285.5 K

C. 269.93 K

D. 250 K

Answer: C

Watch Video Solution

540. A solution of protein (extracted from crabs) was prepared by dissolving 0.75 g in 125 cm^3 of an aqueous solution. At $4^\circ C$ an osmotic pressure rise of 2.6 mm of the solution was observed. Then molecular weight of protein is (Assume density of solution is $1.00\frac{g}{c}m^3$):

A. 9.4×10^5

B. 5.4×10^5

C. 5.4×10^{10}

D. 9.4×10^{10}

Answer: B

 Watch Video Solution

541. A substance is completely trimerised on dissolution in a solvent. The van.t Hoff factor (i) for such change is:

A. 1

B. 2

C. 3

D. 1/3

Answer: D

 Watch Video Solution

542. van.t Hoff factor for a dilute solution of sodium argento cyanide is:

A. 2

B. 0.25

C. 0.5

D. 3

Answer: A

Watch Video Solution

543. At $40^\circ C$, the vapour pressures (in torr) of methyl alcohol (A) and ethyl alcohol (B) solution is represented by: $P = 120X_A + 138$, where X_A is mole-

fraction of methyl alcohol, then the value of $\lim X_A \to 0 \frac{P_B^\circ}{X_B}$ and $\lim X_B \to 0 \frac{P_A^\circ}{X_A}$ are:

A. 138, 258

B. 258, 138

C. 120, 138

D. 138, 125

Answer: A

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544. The use of common salts, e.g., NaCl or $CaCl_2$ anhydrous is made to clear snow on the roads. This causes:

A. A lowering in f.pt. of water

B. A lowering in m.pt. of ice

C. Ice melts at the temperature of atmosphere present at that time

D. All

Answer: D

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545. 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

Answer: B

Watch Video Solution

546. In which of the following molecular weight determination methods, sensitivity of the measurements decreases as the molecular weight of the solute increases ?

A. Elevation of boiling point/depression in f.pt.

B. Viscosity

C. Osmotic pressure

D. None

Answer: A

Watch Video Solution

547. Who was awarded Nobel Prize for chemistry in 1901 for discovering laws of osmotic pressure for solutions ?

A. van't Hoff

B. Pauling

C. Berkeley

D. Seaberg

Answer: A

Watch Video Solution

548. When crystal of the solute is introduced into a super saturated solution of the solute:

A. The solute dissolves

B. The excess solute crystallises out

C. The solution becomes unsaturated

D. The solution remains super saturated

Answer: B

Watch Video Solution

549. Vapour pressure of a solution containing non-volatie solute is:

A. More than the vapour pressure of a solven

B. Less than the vapour pressure of solven

C. Equal to the vapur pressure of solvent

D. None

Answer: B

Watch Video Solution

550. The relative lowering of vapour pressure is equal to the mole fraction of the non-volatile solute. This statement was given by:

A. Raoult

B. Henry

C. Joule

D. Dalton

Answer: A

Watch Video Solution

551. Assuming each salt to be $90\,\%$ dissociated which of the following will have highest osmotic pressure:

A. Decinormal $Al_2(SO_4)_3$

B. $BaCl_2$

C. Decinormal Na_2SO_4

D. A solution obtained by mixing equal volumes of (b) and (c)and filtering

Answer: A

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552. When a solution is separated from a solvent by semipermeable membrane, then phenomenon taking place is called as:

A. Osmosis

B. Diffusion

C. Solubility

D. None

Answer: A

Watch Video Solution

553. When a substabce is dissolved in a solvent, the vapour pressure of solvent decresases. This brings:

A. An increase in b.pt. of the solution

B. A decrease in b.pt. of a solution

C. An increase in f.pt. of the solvent

D. None

Answer: A

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554. If a thin slice of sugar beet is placed in concentrated solution of NaCl then:

A. Sugar beet will lose water from its cells

B. Suagar beet will absorb water from solution

C. Sugar beet will neither absorb nor lose water

D. Sugar beet will dissolve in solution

Answer: A

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555. The temperature at which vapour pressure of a solvent in its liquid and solid phase becomes same is called:

A. b.pt.

B. f.pt.

C. Krafft point

D. None

Answer: B

Watch Video Solution

556. As a result of osmosis, the volume of the concentrated solution:

A. Gradually decreases

B. Gradually increases

C. Suddenly increases

D. None

Answer: B

Watch Video Solution

557. The osmotic, pressure of a solution can be accurately measure in the shortest possible time by:

A. Berkrley and Hartley method

B. Morse and Frazer method

C. Pfeffer method

D. None

Answer: A

 Watch Video Solution

558. Dissolution of a solute is an exothermic process if:

A. Hydration energy gt Lattic energy

B. Hydration energy gtLattic energy

C. Hydration energy=Lattic energy

D. None

Answer: A

 Watch Video Solution

559. The boiling point of an azeotropic mixture of water and ethyl alcohol is less than that of theoretical value of water and alcohol mixture. Hence the mixture shows:

A. That solution is highly saturated

B. Positive deviation from Raoul's law

C. Negative deviation from Raoul' law

D. Nothing can be said

Answer: B

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560. Which solution would exhibit abnormal osmotic pressure ?

A. Aqueous solution of urea

B. Aqueous solution of common salt

C. Aqueous solution of glucose

D. Aqueous solution of sucrose

Answer: B

Watch Video Solution

561. Van't Hoff factor(i):

A. Is Less than one in case of dissociation

B. Is more than one in case of association

C. I = normal molecular mass / observed molecular mass

D. I = observed molecular mass / normal molecular mass

Answer: C

Watch Video Solution

562. Acetic acid on dissolution in benzene will show:

A. Two times of its normal molecular weight

B. Its normal molecular weight

C. Half of its normal molecular weight

D. None

Answer: A

Watch Video Solution

563. Which salt shows maximum osmotic pressure in its 1 M solution ?

A. $AgNO_3$

B. Na_2SO_4

C. $(NH_4)_3PO_4$

D. $MgCl_2$

Answer: C

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564. Solutions distilled without change in composition at a temperature are called:

A. Atmorphous

B. Azeotropic mixture

C. Ideal solution

D. Super saturated solution

Answer: B

Watch Video Solution

565. To form a super saturated solution of salt one must:

A. Cool slowly

B. Coll rapidly

C. Add some salt to cold solution

D. Use a clear vessel

Answer: B

Watch Video Solution

566. By adding water to the solution, its:

A. Concentration remains same

B. Concentration increase

C. Ionisation decreases

D. Concentration decreases

Answer: D

Watch Video Solution

567. The elevation in boiling point for one molal solution of a solute in a solvent is called:

A. Cryoscopic constant

B. Boiling point constant

C. Molal Ebullioscopic constant

D. None

Answer: C

Watch Video Solution

568. Boiling point of a solution is independent of

A. Amount of solution

B. Pressure

C. Nature of solvent

D. Concentration of solution

Answer: A

Watch Video Solution

569. Which solution will show maximum elevation in b.pts:

A. 0.1 M KCl

B. 0.1 M $BaCl_2$

C. 0.1 M $FeCl_3$

D. 0.1 M $Fe_2(SO_4)_3$

Answer: D

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570. The solution which show positive or negative deviation from Raoult's law are called:

A. Ideal solutions

B. True solutions

C. Non-ideal solutions

D. Colloidal solutions

Answer: C

Watch Video Solution

571. Which involves osmosis ?

A. Crenation

B. Plasmolysis

C. Haemolysis

D. All

Answer: D

 Watch Video Solution

572. On mixing 10 mL of acetone with 40 ml of chlorofrom, the total volume of the solution is:

A. $< 50ml$

B. $> 50ml$

C. $= 50mL$

D. Cannot be predicted

Answer: A

Watch Video Solution

573. Solubility of solutes which dissolve with the liberation of heat decreases with:

A. Decrease in temperature

B. Increase in temperature

C. No change in temperature

D. None

Answer: B

Watch Video Solution

574. Two solutions have different osmotic pressures. The solution of lower osmotic pressure is called:

A. Isotonic solution

B. Hypertonic solution

C. Hypotonic solution

D. None

Answer: C

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575. At high altitudes the boiling point of water decreases because:

A. Atmospheric pressure is low

B. Temperature is low

C. Atmospheric pressure is high

D. None

Answer: A

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576. The vapour pressure of a solution is proportional to:

A. Mole fraction of solute

B. 1/(mole fraction of solute)

C. Mole fraction of solvent

D. None

Answer: C

Watch Video Solution

577. The pressure under which liquid and its vapour can coexist in equilibrium is known as:

A. Normal vapour pressure

B. Saturated vapur pressure

C. Read vapour pressure

D. Limiting vapour pressure

Answer: B

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578. The relative lowering of vapour pressure in case of dilute solutions is directly proportional to :

A. Molality

B. Molarity

C. Mole fraction

D. All

Answer: D

 Watch Video Solution

579. The substances whose solubility decreases with increase in temperature :

A. NaOH

B. Na_2CO_3

C. Na_2SO_4

D. All

Answer: D

Watch Video Solution

580. In two solution having different osmotic pressure, the solution of higher osmotic pressure is called :

A. Isotonic solution

B. Hypertonic solution

C. Hypotonic solution

D. None

Answer: B

Watch Video Solution

581. On mixing 10 mL of carbon tetrachloride with 10 mL of benzene the total volume of the solution is:

A. $> 20mL$

B. $< 20mL$

C. $= 20mL$

D. Cannot be predicted

Answer: C

Watch Video Solution

582. The factor $\frac{\Delta Tf}{K_f}$ Represents :

A. Molarity

B. Formality

C. Normality

D. Molality

Answer: D

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583. A teacher one day pointed out to his students the peculiar fact that water is unique liquid which freezes exactly at $0^{\circ}C$ and boils

exactly at $100^{\circ}C$. He asked the students to find the correct statement based on this fact :

A. Whater dissolves anything however sparingly the dissolution may be

B. Water is a polar molecule

C. Boiling and freezing temperature of water were used to define a temperature scale

D. Liquid water is denser than ice

Answer: C

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584. When an ideal binary solution is in equilibrium with its vapour, molar ratio of the two components in the solution and in the vapour phase is:

A. Same

B. Different

C. May or may not be same depending upon volatile nature of the two

components

D. All

Answer: C

Watch Video Solution

585. The osmotic pressure of a dilute solution is directly proportional to the:

A. Diffusion rate of the solute

B. Tonic concentration

C. Boiling point

D. Flow of solvent from a concentrated solution

Answer: B

Watch Video Solution

586. If Raoult's law is obeyed, the vapour pressure of the solution is directly proportional to:

A. Mole fraction of solvent

B. Mole fraction of the solute

C. Mole fraction of the solvent and solute

D. The volume of the solution

Answer: A

Watch Video Solution

587. Boiling point of water is defined as the temperature at which:

A. Vapour pressure of water is equal to that on one atmospheric pressure

B. Bubbles are formed

C. Steam comes out

D. None

Answer: A

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588. The melting points of most of the solid substances increase with an increase of pressure acting on them. However, ice melts at a temperature lower than its usual meiting point, when the pressure increases. This is because:

A. Ice is less denser than water

B. Pressure generates heat

C. The bonds break under pressure

D. Ice is not a true sold

Answer: A

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

A. $0^\circ C$

B. Above $0^\circ C$

C. $1^\circ C$

D. Below $0^\circ C$

Answer: D

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590. The solubility of a gas in liquid at a temprature is directly proportional to its:

A. Density

B. Melting point

C. Boiling point

D. Pressure

Answer: D

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591. An example of a solution having liquid in gas is:

A. Moist air

B. Dry air

C. Au-Hg

D. $C_2H_5OH+H_2O$

Answer: A

 Watch Video Solution

592. Camphor is used as solvent to determine molecular weight of non-volatile solute by Rast method because. For camphor:

A. Being cheap

B. High m.pt.

C. Molal depression constant is high

D. None

Answer: C

Watch Video Solution

593. The vapour pressure of water depends upon:

A. Surface area of container

B. Volume of container

C. Temperature

D. All

Answer: C

Watch Video Solution

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

A. Solute only

B. Solvent only

C. BOTH (A) AND (B)

D. None

Answer: B

Watch Video Solution

595. At low concentrations, the statement that equimolal solutions under a given set of experimental conditions have equal osmotic pressures is true for :

A. All solutions

B. Solutions of non-electrolytes which neither dissociates nor associater

C. Solutions of electrolytes only

D. None

Answer: B

Watch Video Solution

596. Among the following substances, the lowest vapour pressure is exerted by :

A. Water

B. Mercury

C. Kerosene

D. Rectified spirit

Answer: B

Watch Video Solution

597. Blood cells retain their normal shapes in solutions which are :

A. Isotonic to blood

B. Hypotonic to blood

C. Hypertonic to blood

D. Equinormal to blood

Answer: A

 Watch Video Solution

598. As a result of osmosis the volume of solution:

A. Remains constant

B. Increases

C. Decreases

D. Increases or decreases

Answer: D

Watch Video Solution

599. Each pair forms ideal solution except:

A. C_2H_5Br and C_2H_5I

B. G_6H_5Cl and C_6H_5Br

C. C_6H_6 and $C_6H_5CH_3$

D. C_2H_5I and C_2H_5OH

Answer: D

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600. The osmotic pressure (P) of a solution is given by relation:

A. $P = \frac{RT}{C}$

B. $P = \frac{CT}{R}$

C. $P = \frac{RC}{T}$

D. $\frac{P}{C} = RT$

Answer: D

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601. Which statement is incorrect about osmotic pressure (P), volume (V) and temperature (T) ?

A. P $\propto$ (1)/(V) if T is constant

B. P $\propto$ T, if V is constant

C. $P \propto V$,if T is constant

D. PV is constant, if T is constant

Answer: C

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602. Solute when dissolved in water:

A. Decreases the vapour pressure of water

B. Increases the boiling point of water

C. Decreases the freezing point of water

D. All of the above

Answer: D

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603. The van.t Hoff factor of NaCl assuming 100% dissociation is :

A. 1/2

B. 2

C. 1

D. 3

Answer: B

Watch Video Solution

604. The molal elevation/depression constant depends upon :

A. Nature of solvent

B. Nature of solute

C. Temperature

D. ΔH solution

Answer: A

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605. An aqueous solution of methanol on 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

Answer: C

Watch Video Solution

606. The depression in freezing point is maximum if .....is used as solvent .

A. Camphor

B. Naphthalene

C. Benzene

D. Water

Answer: A

Watch Video Solution

607. When mercuric iodide is added to the aqueous solution of potassium iodide the:

A. Freezing point is raised

B. Freezing point is lowered

C. Freezing point does not change

D. Boiling point does not change

Answer: A

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608. The osmotic pressure of a dilute solution is given by :

A. P=$P_0 \times N_1$

B. $\pi V = nST$

C. $\Delta P = P_0 N_2$

D. `(DeltaP)/(P_0)= (P_0-P_s)/(P_o)

Answer: B

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609. For a dilute solution , Raoult.s law states that:

A. The lowering of vapour pressure is equle to the mole fraction of solute

B. The relative lowering of vapour pressure is equal to the mole fraction of solute

C. The relative lowering of vapour pressure is proportional to the amount of solute in solution

D. The vapour pressure of the solution is equal to the mole fraction of solvent

Answer: B

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610. Which of the following is not a colligative property.

A. Lowering of vapour pressure

B. Freezing point

C. Osmotic pressure

D. Elevation of boiling point

Answer: B

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611. Blood has been found to be isotonic with :

A. Normal saline solution

B. Saturated NaCl solution

C. Saturated KCl solution

D. Staurated solution of a 1 : 1 mixture of NaCl and KCl

Answer: A

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612. Which condition is not satisfied by an ideal solution:

A. ΔH mixing = 0

B. ΔV mixing = 0

C. ΔS mixing = 0

D. Obeyance of Raoult's law

Answer: C

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613. Isotonic solutions are those which have the:

A. Same osmotic pressure

B. Same molarity

C. Same density

D. Same normality

Answer: A

Watch Video Solution

614. The correct relationship between the boiling points of very dilute solution of $AlCl_3(t_1)$ and $CaCl_2(t_2)$, having the same molar concentration , as :

A. $t_1 = t_2$

B. $t_1 > t_2$

C. $t_2 > t_1$

D. $t_2 \geq t_1$

Answer: B

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615. Two solutions of KNO_3 and CH_3COOH are prepared separately. Molarity of both is 0.1 M and osmotic pressures are P_1 and p_2 respectively. The correct relationship between the osmotic pressure is :

A. $P_2 > P_1$

B. $P_1 = P_2$

C. $P_1 > P_2$

D. $\frac{P_1}{P_1 + P_2} = \frac{P_2}{P_1 + P_2}$

Answer: C

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616. What will be the molecular weight of NaCl determined experimentally following elevation in the boiling point or depression in freezing point method ?

A. < 58.5

B. > 58.5

C. $= 58.5$

D. None of these

Answer: A

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617. At a given temperature if P is the vapour pressure of a solution and P_0 that of its pure solvent , the relative lowerning of vapour pressure of the solution is given by :

A. $\frac{P_0 - P}{P_0}$)

B. $\frac{P - P_0}{P_0}$

C. `(P_0)/(P)

D. $\frac{P}{P_0}$

Answer: A

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618. The lowering of vapour pressure of a solvent by the addition of a non-volatile solute to it , is directly proportional to :

A. The strength of the solution

B. The nature of the solute in the solution

C. The atmospheric pressure

D. All

Answer: A

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619. A thermometer which can be used only accurate measurement of small differences in temperature is know as a :

A. Beckmann's thermometer

B. Contact thermometer

C. Clinical thermometer

D. Platinum resistance thermometer

Answer: A

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620. Boiling point elevation is :

A. Additive property

B. Contitutive property

C. Colligative property

D. Partly additive and partly constitutive

Answer: C

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621. 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 one

B. Greater than one

C. One

D. Zero

Answer: B

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622. An example of colligative property is :

A. Freezing point

B. Boiling point

C. Vapour pressure

D. Osmotic pressure

Answer: D

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623. A mixture of benzene and toluene forms :

A. An ideal solution

B. Non-ideal solution

C. Suspension

D. Emulsion

Answer: A

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624. The colligative properties of a solution depend on :

A. Number of solute particles present in it

B. Chemical nature of the solute particles present in it

C. Nature of the solvent used

D. None

Answer: A

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625. Which of the following methods can not be used to determine the molecular weight of non-volatile solute?

A. Victor Meyer's method

B. Osmoticpressure method

C. Cryoscopic method

D. Ebullioscopic method

Answer: A

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626. If P_0 and P_δ are the vapour pressure of solvent and solution respectively and N_1 and N_2 are the mole of solute and solvent then:

A. $P_s = P_O n\_1$

B. $P_s = P_O n_2$

C. $P_0 = P_s n_2$

D. $P_s = P_0 \left(\frac{n_1}{n_2} \right)$

Answer: A

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627. Osmosis is the spontaneous flow through a semipermeable membrane of :

A. A less concentrated solution into more in to more concentrated solution

B. The Solvent from a solution of lower concentration to one of higher concentration

C. Solute particles from a solution of higher concentration to one of lower concentration

D. None

Answer: B

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628. The vapour pressure of a dilute solution of a solute is not influenced by :

A. Temperature of solution

B. Melting point of solute

C. Mole fraction of solute

D. Deegree of dissociation of solute

Answer: B

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629. The vapour pressure (VP) of a dilute solution of non-volatile solute is P and the VP of pure solvent is P_0 the lowering of the VP is :

A. $+ve$

B. $-ve$

C. $\frac{P}{P_0}$

D. $\frac{P_0}{P}$

Answer: A

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630. The highest temperature at which vapour pressure of a liquid can be measured is :

A. B.pt. of liquid

B. Critical temperature (T)

C. Critical solution temperature

D. Inversion temperature

Answer: B

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631. The value of K_f for water is 1.86 calculated from glucose solution . The value of K_f for water calculated for NaCl solution will be :

A. $= 1.86$

B. < 1.86

C. > 1.86

D. Zero

Answer: A

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632. 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 was removed

B. Same as what would be if the glass plate was removed

C. Less than what would be if the glass plate was removed

D. Cannot be predicted

Answer: B

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633. The molecular weight of benzoic acid as determined by depression in freezing point method corresponds to :

A. Ionization of benzoic acid

B. Dimerization of benzoic acid

C. Trimerization of benzoic acid

D. Solvation of benzoic acid

Answer: B

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634. The elevation of boiling point method is used for the determination of molecular weight of :

A. Non-volatile and soluble solute

B. Non-volatile and insoluble solute

C. Volatile and soluble solute

D. Volatile and insoluble solute

Answer: A

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635. Sodium sulphate is soluble in water whereas barium sulphate is sparingly soluble because:

A. The hydration energy of sodium sulphate is more than its lattice energy

B. The lattice energy of barium sulphate is less than the hydration energy

C. The lattice energy has no role to play in solubility

D. The hydroation energy of sodium sulphate is less than its lattice energy

Answer: A

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636. Which solute can from saturated solutions in water ?

A. Sodium acetate

B. Hypo

C. Glauber's salt

D. All

Answer: D

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637. Two solutions A and B are separated by seimpereneable membrane . If liquid flows from A and B then :

A. A is more concentrated than B

B. A is less concentrated than B

C. Both solutions have some concentration

D. None

Answer: B

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638. Molal elevation constant of a liquid is :

A. The elevation in b.pt. which would be produced by dissolving one mole of solute in 100 g of solvent

B. The elevation of b.pt. which would be produced by dissolving 1 mole solute in 10 g of solvent

C. Elevation in b.pt. which would be produced by dissolving 1 mole of solute

in 1000 g of solvent

D. None

Answer: C

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639. One mole each of urea, glucose and sodium chloride were dissolved in one litre of water . Equal osmotic pressure will be produced by solutions of :

A. Urea and glucose

B. Sodium chloride and urea

C. Glucose and sodium chloride

D. None

Answer: A

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640. The solubility of a solid in a liquid depends on :

A. Nature of solute

B. Nature of solvent

C. Temperature

D. All

Answer: D

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641. Alcohol has ..... Vapour pressure than water at the same temperature :

A. More

B. Less

C. Same

D. None

Answer: A

642. The mixtureof n-hexane and n-heptane is an example of :

A. Ideal solution

B. None-ideal solution

C. Dilute solution

D. Real solution

Answer: A

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