CHEMISTRY

BOOKS - MARVEL CHEMISTRY (HINGLISH)

SOLUTIONS AND COLLIGATIVE PROPERTIES

Multiple Choice Questions

1. A solution is defined as a :

A. homogeneous mixture of two or more substances

B. heterogeneous mixture of two or more substances

C. homogeneous mixture of liquid and solid components only

D. homogeneous mixture consisting water as one of the components

Answer: A

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2. An Example for a solution containing liquid solute in gas solvent is _____.

A. Moist air

B. Dry air

C. Au-Hg

D. $C_2H_5OH + H_2O$

Answer: A

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3. The substances involved in solution are called.

A. mole

B. atoms

C. molecules

D. components

Answer: D

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4. Solutions are of _____ types

A. three

B. six

C. nine

D. eleven

Answer: C

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5. In solution ,the molecular size of particles is

A. less than 10^{-9} m

B. equal to 10^{-9} m

C. more than 10^{-9} m

D. equalto 10^{-9} cm

Answer: A

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6. Which of the following possesses physical state of solute and solvent are liquid and solid respectively ?

A. Solution of sugar in water

B. Zinc amalgam

C. Solution of naphthalene in benzene

D. Brass

Answer: B

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7. Which of the following pair of solution having different physical state of solute ?

A. Homogeneous mixture of chloroform in N_2 gas, solution of CO_2 in water

B. Brass, homogenous mixture of camphor in N_2 gas

C. Sodium amalgam, moist air

D. Solution of H_2 gas in Pd metal mixture of N_2 and O_2

Answer: A and C

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8. $25mLHNO_3$. If the volumes are mixed with $75mL$ of $4.0MHNO_3$. If the volumes are additive, the molarity of the final mixture would be:

A. 3.25M

B. 4.0 M

C. 3.75 M

D. 3.50 M

Answer: C

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9. The amount of anhydrous Na_2CO_3 present in 250 ml of 0.25 M solution is

A. 6.225g

B. 66.25g

C. 6.0g

D. 6.625g

Answer: D

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10. If 5.85g of $NaCl$are dissolved in$90g$ of water,the moles fraction of $NaCl$ is

A. 0.1

B. 0.3

C. 0.01

D. 0.0196

Answer: D

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11. 0.8g of H_2SO_4 is present in 2 litres of a solution. The molarity of the solution is

A. 0.1M

B. 0.004 M

C. 0.2M

D. 0.01 M

Answer: B

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12. Molarity is expressed as

A. Gram / litre

B. Moles / litre

C. Litre / mole

D. Moles / 1000 gms

Answer: B

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13. 20 mL of HCl solution requires 19.85 mL of 0.01 M $NaOH$ solution for complete neutralization. The molarity of HCl solution is _____M.

A. 0.0099

B. 0.099

C. 0.99

D. 9.9

Answer: A

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14. If 5.85g of $NaCl$(molecular weight58.5)is dissolved in water and the solution is made up to 0.5litre , the molarity of the solution will be

A. 0.2

B. 0.4

C. 1.0

D. 0.1

Answer: A

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15. 2.5 litre of 1 M NaOH solution are mixed with another 3 litre of 0.5 M NaOH solution Then the molarity of the resulting

A. 1.0 M

B. $0.73M$

C. $0.80M$

D. $0.50M$

Answer: B

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16. When the concentration is expressed as the number of moles of a solute per kg of solvent it is known as

A. Normality

B. Molarity

C. Molality

D. Mass percentage.

Answer: C

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17. The normality of 2.3 M H_2SO_4 solution is

A. 2.3 N

B. 4.6 N

C. $0.46N$

D. $0.23N$

Answer: B

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18. 10 litre solution of urea contains 240g urea. The active mass of urea will be

A. 0.04

B. 0.02

C. 0.4

D. 0.2

Answer: C

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19. The amount of $K_2Cr_2O_7$ (eq. wt. 49.04) required to prepare 100 ml of its 0.05N solution is

A. 2.9424 g

B. $0.4904g$

C. $1.4712g$

D. $0.245g$

Answer: D

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20. 25 mL of a solution of barium hydroxide on titration with 0.1 molar solution of hydrochloric acid gave a titre value of 35 mL. The molarity of barium hydroxide solution was

A. 0.07

B. 0.14

C. 0.28

D. 0.35

Answer: A

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21. 2.0 molar solutioin is obtained when 0.5 mole solute is dissolved in

A. 250 ml solvent

B. 250g solvent

C. 250 ml solution

D. 1000ml solvent

Answer: C

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22. The number of moles present in 2 litre of $0.5MNaOH$ is:

A. 0.5

B. 0.1

C. 1

D. 2

Answer: C

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23. What will be the normality of a solution containing 4.9 g H_3PO_4 dissolved in 500 ml water ?

A. 0.3

B. 1.0

C. 3.0

D. 0.1

Answer: A

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24. 3.0 molal $NaOH$ solution has a density of $1.110g/mL$. The molarity of the solution is:

A. 3.0504

B. 3.64

C. 3.05

D. 2.9732

Answer: D

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25. Which one of the following modes of expressing concentration of solution is independent of temperature

A. Molarity

B. Molality

C. Formality

D. Normality

Answer: B

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26. The molality of a solution is

A. Number of moles of solute per 1000 ml of the solvent

B. Number of moles of solute per 1000 gm of the solvent

C. Number of moles of solute per 100 ml of the solution

D. Number of gram equivalents of solute per 1000 ml of the solution

Answer: B

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27. The number of moles of a solute in its solution is 20 and total number of moles are 80. The mole fraction of solute is

A. 2.5

B. 0.25

C. 1

D. 0.75

Answer: B

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28. Two solutions of a substance (non-electrolyte) are mixed in the following manner , 480 mL of 1.5 M [first solution] + 520 mL of 1.2 M [second solution] . What is the molarity of the final mixture ?

A. 1.20 M

B. 1.50 M

C. 1.344 M

D. 2.70 M

Answer: C

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29. Molar solution means 1 mole of solute present in

A. 1000 g of solvent

B. 1 litre of solvent

C. 1 litre of solution

D. 1000 g of solution

Answer: C

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30. What will be the molality of solution having 18 g of glucose (molecular weight = 180) dissolved in 500 g of water ?

A. 1m

B. $0.5m$

C. 0.2 m

D. 2 m

Answer: C

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31. Molarity of 0.2 N H_2SO_4 is

A. 0.2

B. 0.4

C. 0.6

D. 0.1

Answer: D

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32. Mole fraction (x) of a component is equal to ____.

A. $\frac{\text{No. of moles of solute}}{\text{Volume of solution in litre}}$

B. $\frac{\text{No. of gram equivalent of solute}}{\text{Volume of solution in litre}}$

C. $\frac{\text{No. of moles of solute}}{\text{Mass of solvent in Kg}}$

D. $\frac{\text{No. of moles of any constituent}}{\text{Total no. of moles of all constituents}}$

Answer: D

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33. When W_B gm solute (molecular mass M_B) dissolves in W_A gm solvent. The molality m of the solution is

A. $\frac{W_B \times M_B}{W_A \times 1000}$

B. $\frac{W_B \times 1000}{M_B \times W_A}$

C. $\frac{W_A \times 1000}{M_B \times W_B}$

D. $\frac{W_A \times M_B}{W_B \times 1000}$

Answer: B

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34. What does normality (N) represent ?

A. $\frac{\text{No. of moles of solute}}{\text{Volume of solution in litre}}$

B. $\frac{\text{No. of gram equivalent of solute}}{\text{Volume of solution in litre}}$

C. $\frac{\text{No. of moles of solute}}{\text{Mass of solvent in kg}}$

D. $\frac{\text{No. of solute molecules}}{\text{Volume of solution}}$

Answer: B

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35. To prepare a solution of concentration of 0.03 g/ml. of $AgNO_3$. What amount of $AgNO_3$ should be added in 60mL of solution?

A. 1.8

B. 0.8

C. 0.18

D. 0.108

Answer: A

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36. 0.5 M of H_2SO_4 is diluted from 1 litre to 10 litre, normality of resulting solution is

A. 1 N

B. 0.1 N

C. 10 N

D. 11N

Answer: B

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37. If one mole of a substance is present in 1kg of solvent then

A. It shows molar concentration

B. It shows molal concentration

C. It shows normality

D. Its shows strengthen gm / gm

Answer: B

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38. 10 grams of a solute is dissolved in 90 grams of a solvent. Its mass percent in solution is

A. 0.01

B. 11.1

C. 10

D. 9

Answer: C

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39. The sum of the mole fraction of the components of a solution is

A. 0

B. 1

C. 2

D. 4

Answer: B

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40. $\frac{100}{10}$ N and 0.1 N solution is called

A. Decinormal and decanormal solution

B. Normal and decinormal solution

C. Normal and decanormal solution

D. Decanormal and decinormal solution

Answer: D

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41. Molarity of 4% NaOH solution is

A. 0.1M

B. $0.5M$

C. $0.01M$

D. $1.0M$

Answer: D

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42. When 6 gm urea dissolve in 180 gm H_2O. The mole fraction of urea is

[Mol. Wt. of urea = 60]

A. $\frac{10}{10.1}$

B. $\frac{10.1}{10}$

C. $\frac{10.1}{0.1}$

D. $\frac{0.1}{10.1}$

Answer: D

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43. The normality of 10% (weight / volume) acetic acid is

A. 1N

B. 10N

C. 1.66N

D. $0.83N$

Answer: C

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44. Molar concentration (M) of any solution =

A. $\frac{\text{No. of moles of solute}}{\text{Volume of solution in litre}}$

B. $\frac{\text{No. of gram equivalent of solute}}{\text{Volume of solution in litre}}$

C. $\frac{\text{No. of moles of solute}}{\text{Mass of solvent in Kg}}$

D. $\frac{\text{No. of moles of any constituent}}{\text{Total no. of moles of all constituents}}$

Answer: A

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45. A solution of $CaCl_2$ is 0.5 mol/litre , then the moles of chloride ion in 500 mL will be :

A. 0.25

B. 0.50

C. 0.75

D. 1.00

Answer: B

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46. The molarity of a 0.2 N Na_2CO_3 solution will be :

A. $0.05M$

B. $0.2M$

C. $0.1M$

D. $0.4M$

Answer: C

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47. A molal solution is one that contains one mole of a solute in

A. 1000 gm of the solvent

B. one litre of the solvent

C. One litre of the solution

D. 22.4 litre of the solution

Answer: A

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48. The unit of molality is

A. Mole per litre

B. Mole per kilogram

C. Per mole per litre

D. Mole litre

Answer: B

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49. How many grams of H_2SO_4 are present in 0.25 g mole of H_2SO_4 ?

A. 2.45

B. 24.5

C. 0.25

D. 245

Answer: B

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50. 2.5 litre of 1 M NaOH solution are mixed with another 3 litre of 0.5 M NaOH solution Then the molarity of the resulting

A. $0.80M$

B. 1.0 M

C. 0.73 M

D. $0.50M$

Answer: C

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51. Which of the following methods of expressing concentration varies with temperature ?

A. Normality

B. Molarity

C. Molality

D. Mole Fraction

Answer: C

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52. Molarity is the most inconvenient unit for expressing concentration because it

A. is very difficult to find out

B. involves difficult calculation

C. involves the accurate measurement of volume of liquids

D. has no unit.

Answer: C

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53. The sum of mole fractions of A, B and C in an aqueous solution containing 0.2 moles of each A, B and C is

A. 0.6

B. 0.2

C. 1.0

D. 3

Answer: C

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54. What volume of 0.8M solution contains 0.1 mol of the solute ?

A. 100ml

B. 125 ml

C. 500 ml

D. 62.5 ml

Answer: B

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55. How many grams of a dibasic acid (Mol. Wt. =200) should be present in 100 ml of its aqueous solution to give decinormal strength

A. 1 g

B. 2 g

C. 10 g

D. 20 g

Answer: A

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56. 3.65grams of HCI dissolved in 16.2g of water. The mole fraction of HCI in the resulting solution is

A. 0.4

B. 0.3

C. 0.2

D. 0.1

Answer: D

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57. The mass of oxalic acid crystals $(H_2C_2O_4.2H_2O)$ required to prepare 50 mL of a 0.2 N solution is:

A. 126 g

B. 12.6g

C. 63g

D. 6.3 g

Answer: D

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58. When 7.1 gm Na_2SO_4 (molecular mass 142) dissolves in 100 ml H_2O ,the molarity of the solution is

A. 2.0 M

B. 1. 0 M

C. $0.5M$

D. $0.05M$

Answer: C

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59. In a mixture of 1 gm H_2 and 8 gm O_2, the mole fraction of hydrogen is

A. 0.66

B. 0.5

C. 0.33

D. 0.75

Answer: A

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60. 4.0 gm of NaOH are contained in one decilitre of solution. Its molarity would be

A. 4 M

B. 2M

C. 1M

D. 1.5 M

Answer: C

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61. 1 gm equivalent of a substance is the weight of the substance which is equivalent to

A. 2 mole of oxygen

B. 1 mole of oxygen

C. 0.5 mole of oxygen

D. 0.25 mole of oxygen

Answer: D

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62. Sum of mole fractions of the two components of a solution is

A. less than one

B. equal to one

C. more than one

D. not fixed

Answer: B

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63. What is the normlity of a 1 M solution of H_3PO_4?

A. 0.33 N

B. 1 N

C. 2N

D. 3N

Answer: D

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64. If density of NH_4OH solution is 1g/ml and it is 35% w/v . Calculate the normality of the solution

A. 1N

B. 5N

C. 10N

D. 20N

Answer: C

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65. To convert molality into which of the following unit of concentration required density of the solution ?

A. Percentage weight by weight

B. Percentage by volume

C. Mole fraction

D. Given all

Answer: B

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66. Which of the following is suitable alternative for density of the solution , when molarity (M) and molality (m) of an aqueous solution of urea is same at fixed temperature ? (Molecular wt. of urea = 60)

A. $1-\frac{3M}{5}$

B. $1-\frac{M}{25}$

C. $\frac{50+3m}{50}$

D. $\frac{25+2m}{25}$

Answer: C

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67. What would be the molarity of $3.0NH_2SO_4$ solution ?

A. 6M

B. 1.5 M

C. 3M

D. 1M

Answer: B

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68. What would be the mole fraction of solute in an aqueous solution of a substance having strength of 4.5 m ?

A. 0.75

B. 0.075

C. 0.45

D. 0.0045

Answer: B

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69. A solution is prepared from A,B,C and D.Mole fraction of A,B and C are 0.1, 0.2 and 0.4 respectively then, mole fraction of D is

A. 0.2

B. 0.1

C. 0.3

D. 0.4

Answer: C

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70. Solubility of a gas in a liquid increases with

A. increase of pressure and increase of temperature

B. decrease of pressure and increase of temperature

C. increase of pressure and decrease of temperature

D. decrease of pressure and decrease of temperature

Answer: C

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71. Which of the following would lose weight on exposure to air ?

A. Conc. H_2SO_4

B. Conc. HNO_3

C. Anhydrous Na_2CO_3

D. A saturated solution of CO_2

Answer: D

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72. The solubility of a gas increases in a liquid solvent with

A. increase in temperature

B. decrease in gas pressure

C. decrease in temperature

D. decrease in amount of solvent.

Answer: C

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73. The statement "The mass of a gas dissolved in a given mass of a solvent at any temperature is proportional to the pressure of the gas above the solvent " is

A. Roault's law

B. Boyle's law

C. Charle's law

D. Henry's law

Answer: D

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74. At 293 K temperature, if partial pressure of all given gases are same, then, which of the following gas possesses maximum solubility in water ?

A. He

B. N_2

C. H_2

D. O_2

Answer: D

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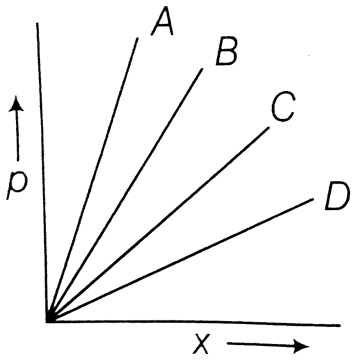
75. At constant temperature, on the basis of given graph which gas possess higher solubility?



p = Partial pressure
x = Solubility

A. A

B. B

C. C

D. D

Answer: D

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76. In which condition, Henry's law is applicable ?

A. Ideal behaviour of gaseous solute at high pressure and low temperature

B. Gaseous solute neither associate nor dissociate in solution

C. Gaseous solute react with solvent

D. Applicable in given all conditions.

Answer: B

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77. Which of the following is a colligative property ?

A. Osmotic pressure

B. Boiling point

C. Vapour pressure

D. Freezing point

Answer: A

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78. The colligative properties of a solution depend on

A. Nature of solute particles present in it

B. Nature of solvent used

C. Number of solute particles present in it

D. Number of moles of solvent only

Answer: C

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79. Which of the following is not a colligative property ?

A. Osmotic pressure

B. Elevation in B.P.

C. Vapour pressure

D. Depression in freezing point.

Answer: C

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80. Which is not a colligative property?

A. Refractive index

B. Lowering of vapour pressure

C. Depression of vapour pressure

D. Elevation of boiling point.

Answer: A

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81. The properties that depend only on the number of solute particles and NOT on its nature are called as _____ properties .

A. Constitutive

B. Additive

C. Colligative

D. Intensive

Answer: C

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82. Which of the following is not a colligative property?

A. ΔT_f

B. ΔT_b

C. K_b

D. Osmotic pressure

Answer: C

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83. Which of the following is a colligative property ?

A. Conductance of a solution

B. Surface tension of a solution

C. Osmotic pressure of a solution

D. Radioactivity of a solution

Answer: C

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84. The solution of sugar in water contains

A. free atoms

B. frees molecules

C. free ions

D. free ions and atoms

Answer: B

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85. For a solution of volatile liquids the partial vapour pressure of each component in solution is directly proportional to

A. Molarity

B. Mole fraction

C. Molality

D. Normality

Answer: B

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

A. Henry's law

B. Raoult's law

C. Ostwald's law

D. Arrhenius's law

Answer: B

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87. Vapour pressure of a solution is _____.

A. Directly proportional to the mole fraction of the solvent

B. Inversely proportional to the mole fraction of the solute

C. Inversely proportional to the mole fraction of the solvent

D. Directly proportional to the mole fraction of the solute.

Answer: A

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88. If P° and P_S are the vapour pressure of the solvent and its solution respectively and x_1 and x_2 are the mole fraction of the solvent and solute respectively, then

A. $P = P^\circ N$

B. $P = P^\circ N_2$

C. $P^\circ = PN_2$

D. $P = P^\circ (N_1 / P_2)$

Answer: A

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89. $5cm^3$ of acetone is added to $100cm^3$ of water . Then the vapour pressure of the vapour pressure of the solution _____.

A. will be equal to the vapour pressure of pure water

B. will be less than the vapour pressure of pure water

C. will be greater than the vapour pressure of pure water

D. will be very large

Answer: B

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90. At 300 K when a solute is added to a solvent its vapour pressure over the mercury reduceds from 50 mm to 45mm. The value of mole fraction of solute will be

A. 0.005

B. 0.010

C. 0.100

D. 0.900

Answer: C

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

A. Mole fraction of the solvent

B. Mole fraction of the solute

C. Weight percentrage of a solute

D. Weight percentrage of a solvent.

Answer: B

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92. Vapour pressure of a liquid depends upon its

A. Temperature but not on volume

B. Volume but not on temperature

C. Temperature and volume

D. Neither on temperature nor on volume

Answer: A

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93. The vapour pressure of a pure liquid is 0.80 atm. When a non-volatile solute is added to this liquid, its vapour pressure drops to 0.60 atm. The mole fraction of the solute in the solution is

A. 0.150

B. 0.25

C. 0.50

D. 0.75

Answer: B

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94. An aqueous solution of glucose was prepared by dissolving 18g of glucose in 90g of water. The relative lowering in vapour pressure is

A. 0.02

B. 1

C. 20

D. 180

Answer: A

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95. Which one of the following is the expression of Raoult's law ?

A. $\frac{p - p_s}{p} = \frac{n}{n + N}$

B. $\frac{p_s - p}{p} = \frac{n}{N + n}$

C. $\frac{p - p_s}{p_s} = \frac{N}{N + n}$

D. $\frac{p_s - p}{p_s} = \frac{N - n}{N}$

Answer: A

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96. $6g$ of urea (molecular weight $= 60$) was dissolved in 9.9 moles of water. If the vapour pressure of pure water is P°, the vapour pressure of solution is :

A. $0.10p_o$

B. $1.10p_o$

C. $0.90p_o$

D. $0.99p_o$

Answer: C

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97. For a dilute solution, Raoult's law states that

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

B. The relative lowering of vapour pressure is equal to 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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98. The determination of correct molecular weight from Raoult's law is applicable to

A. An electrolyte in solution

B. A non-electrolyte in a dilute solution

C. A non-electrolyte in a concentration solution

D. An electrolyte in a liquid solvent

Answer: B

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99. One mole of 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. $3/2$

D. $1/2$

Answer: A

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100. Which of the following is incorrect ?

A. Relative lowering of vapour pressure is independent of the nature of the solute and the solvent

B. The vapour pressure is a colligative property

C. Vapour pressure of a solution is lower than that of the solvent

D. The relative lowering of vapour pressure is directly proportional to the original pressure.

Answer: B

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101. The vapour pressure of a solution increases when

A. The temperature is raised

B. the volume is increased

C. the number of moles of the solute is increased

D. the temperature is lowered

Answer: A

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

A. $+ve$

B. $-ve$

C. P/P_0

D. P_0 / P

Answer: A

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

A. It obeys Raoult's Law

B. $P_A = P_A^0 X_A$

C. $P_A = P_A^0 X_B$

D. $P_A = P_A^- (1 - X_B)$

Answer: C

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104. The law of relative lowering of vapour pressure was given by

A. Raoult

B. Ostwald

C. Vant Hoff

D. Lewis

Answer: A

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105. 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 mass of the substance will be:

A. 18.0

B. 342

C. 60

D. 180

Answer: D

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106. The vapour pressure of water at room temperature is 30 mm of Hg. If the mole fraction of the water is 0.9, the vapour pressure of the solution will be :

A. 30 mm of Hg

B. 2 4 mm of Hg

C. 21 mm of Hg

D. 27 mm of Hg

Answer: D

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107. The vapour pressure of water at room temperature is 23.8 mm Hg. The vapour pressure of an aqueous solution of sucrose with mole fraction 0.1 is equal to

A. 23.9 mm Hg

B. 24.2 mm Hg

C. 21.42 mm Hg

D. 31.44 mm Hg

Answer: C

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

A. 15

B. 150

C. 1500

D. 1.5

Answer: B

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109. The highest temperature at which V.P. of a liquid can be measured is

A. critical temperature

B. inversion temperature

C. critical solution temperature

D. boiling point of liquid

Answer: D

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110. The rise in boiling point of a solution containing $1.8g$ glucose in $100g$ of a solvent is $0.1^\circ C$. The molal elevation constant of the liquid is-

A. $0.01K/m$

B. $0.1K/m$

C. $1K/m$

D. $10K/m$

Answer: C

Watch Video Solution

111. 0.15g of a subatance dissolved in 15g of solvent boiled at a temperature higher at 0.216° than that of the pure solvent. Calculate the molecular weight of the substance. Molal elecation constant for the solvent is $2.16^\circ C$

A. 1.01

B. 10

C. 10.1

D. 100

Answer: D

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112. Which of the following statement are CORRECT for the boiling point of solvent containing a dissolved solid substance ?

A. Boiling point of the liquid is depressed

B. Boiling point of the liquid is elevated

C. There is no effect on the boiling point

D. The change depends upon the polarity of liquid.

Answer: B

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113. When a substance is dissolved in a solvent the vapour pressure of solvent decreases. This brings:

A. A decrease in boiling point of solution

B. An increase in boiling point of the solution

C. A decrease in freezing point of the solution

D. An increase in freezing point of the solution.

Answer: B

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114. 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 (K_b of water is $5.2^{\circ}C$ per 100 g of water)

A. 120

B. 60

C. 180

D. 600

Answer: B

Watch Video Solution

115. If the solution boils at a temperature T_1 and solvent at a temperature T_2 the elevation of boiling point is given by:

A. $T_1 + T_2$

B. $T_1 - T_2$

C. $T_2 - T_1$

D. $T_1 \div T_2$

Answer: B

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116. The molal elevation constant is the ratio of the elevation in boiling point to :

A. Molarity

B. Molality

C. Mole fraction of solute

D. Mole fraction of solvent

Answer: B

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117. The temperature, at which the vapour pressure of a liquid becomes equal to the atmospheric pressure is known as

A. Freezing point

B. Boiling point

C. Absolute temperature

D. Normal temperature

Answer: B

Watch Video Solution

118. When common salt is dissolved in water

A. Melting point of the solution increases

B. Boiling point of the solution increases

C. Boiling point of the solution decreases

D. Both melting point and boiling point decreases

Answer: B

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

A. Boiling point constant

B. Molal elevation constant

C. Cryoscopic constant

D. Molecular elevation constant

Answer: B

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120. 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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121. When 10 of a non-volatile solute is dissolved in 100 g of benzene . It raises boiling point by $1^{\circ}C$ then moles mass of the solute is _____.

A. 223 g

B. 233 g

C. 243 g

D. 253 g

Answer: D

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122. Unit of boiling point elevation constant (K_b) is _____.

A. $kgmol^{-1}K^{-1}$

B. $molkg^{-1}K^{-1}$

C. $Kkgmol^{-1}$

D. $Kmolkg^{-1}$

Answer: C

Watch Video Solution

123. Solute when dissolved in water:

A. Increases the vapour pressure of water

B. Decreases the boiling point of water

C. Decreases the freezing point of water

D. Vapour pressure remains same

Answer: C

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124. The freezing point of 1% of lead nitrate solution in water will be :

A. Below $0^\circ C$

B. $0^\circ C$

C. $1^\circ C$

D. $2^\circ C$

Answer: A

Watch Video Solution

125. What is the effect of the addition of sugar on the boiling and freezing points of water?

A. Both boiling point and freezing point increases

B. Both boiling point and freezing point decreases

C. Boiling point increases and freezing point decreases

D. Boiling point decreases and freezing point decreases

Answer: C

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126. During depression of freezing point in a solution, the following are in equilibrium:

A. Liquid solvent, solid solvent

B. Liquid solvent, solid solute

C. Liquid solute, solid solute

D. Liquid solute, solid solvent

Answer: A

Watch Video Solution

127. which will show maximum depression in freezing point when concentration is 0.1 M?

A. NaCl

B. Urea

C. Glucose

D. K_2SO_4

Answer: D

Watch Video Solution

128. When a solute is dissolved in a solvent

A. vapoure pressure of the solvent is increased

B. freezing point of the solution becomes more than that of solvent

C. boiling point of the solution becomes lower thant that of solvent

D. vapour pressure of the solvent is decreased

Answer: D

Watch Video Solution

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

A. reducing visocity

B. reducing specific heat

C. reducing freezing point

D. reducing boiling point

Answer: C

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130. Cryoscopy is concerned with

A. osmotic pressure of a solution

B. elevation of boiling point of a solution

C. depression in freezing point of a solution

D. relative lowering in vapour pressure of a solution

Answer: C

View Text Solution

131. If all the following four compounds were sold at the same price, which would be cheapest for preparing an antifreeze solution for a car radiator ?

A. CH_3OH

B. C_2H_5OH

C. $C_2H_5(OH)_2$

D. $C_3H_5(OH)_3$

Answer: A

Watch Video Solution

132. Equimolar solutions in the same solvent have-

A. same boiling point but different freezing points

B. same freezing point but different boiling points

C. same freezing point and boiling points

D. different freezing and boiling points

Answer: D

Watch Video Solution

133. The molal depression constant depends upon

A. nature of the solute

B. nature of the solvent

C. heat of solution of the solute in the solvent

D. vapour pressure of the solution

Answer: B

Watch Video Solution

134. The depression of freezing point is directly proportional to

A. mole fraction of the solution

B. molarity of the solution

C. molality of the solution

D. molality of the solvent

Answer: C

Watch Video Solution

135. Which of the following aqueous solution has minium freezing point?

A. 0.01 m NaCl

B. 0.005 mC_2H_5OH

C. 0.005 m MgI_2

D. 0.001m $MgSO_4$

Answer: A

Watch Video Solution

136. In the depression of freezing point experiment , it is found that :

(P) the vapour pressure of the solution is less than that of pure solvent .

(Q) the vapour pressure of the solution is more than that of pure solvent

.

(R) only solute molecules solidify at the freezing point .

(S) only solvent molecules solidify at the freezing point .

A. only solute molecules solidify at freezing point

B. only solvent molecules solidify at freezing point

C. vapour pressure of the solution is more than that of pure solvent

D. vapour pressure of the solution is less than that of pure solvent.

Answer: B

Watch Video Solution

137. An aqueous solution of a non-electrolye boils at $100.52^\circ C$. The freezing point of the solution will be

$(K_b = 0.52 K kg mol^{-1}, Kk_g = 1.86 K kg mol^{-1})$

A. $0^\circ C$

B. $-1.86^\circ C$

C. $1.86^\circ C$

D. $-0.52^\circ C$

Answer: B

View Text Solution

138. After adding non-volatile solute, freezing point of water decreases to $-0.186^{\circ}C$. Calculate ΔT_b if :

$K_f = 1.86\text{K kg mol}^{-1}$ and $K_b = 0.521\text{K kg mol}^{-1}$

A. 0.521

B. 0.0521

C. 1.86

D. 0.0186

Answer: B

Watch Video Solution

139. The freezing point of a 0.05 molal solution of a non-electrolyte in water is $\left[K_f = 1.86^\circ C/m\right]$

A. $-1.86^\circ C$

B. $-9.3^\circ C$

C. $-0.093^\circ C$

D. $-0.93^\circ C$

Answer: C

Watch Video Solution

140. What is the molality of ethy alcohol (mol. wt. = 46) in aqueous solution which freezes at $-10^\circ C$? $\left(K_f \text{ for water } 1.86 \text{ K } molality^{-1}\right)$

A. 3.504

B. 4.567

C. 5.376

D. 6.315

Answer: C

View Text Solution

141. If K_f value of H_2O is 1.86. The value of ΔT_f for 0.1 m solution of non-volatile solute is

A. 18.6

B. 0.186

C. 1.86

D. 0.0186

Answer: B

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142. 1% solution of $Ca(NO_3)_2$ has freezing point:

A. $0^\circ C$

B. Less than $0^\circ C$

C. Greater than $0^\circ C$

D. 273 K

Answer: B

Watch Video Solution

143. A substance associates as trimer in their solution, then which of the following alternative is possible for depression in freezing point of m molal solution ?

A. $\frac{mK_f}{3}$

B. $\frac{mK_f}{4}$

C. $\frac{mK_f}{5}$

D. $\frac{mK_f}{8}$

Answer: A

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

Here $n_2 =$ mass of solute, V = volume of solution, $\pi =$ osmotic pressure.

A. $M_B = \frac{m}{\pi} VRT$

B. $M_B = \frac{mRT}{\pi V}$

C. $M_B = \frac{m}{\pi} / \frac{V}{RT}$

D. $M_B = \frac{m}{V}. \pi RT$

Answer: B

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145. In osmosis, there is movement of

A. Solvent molecules move from higher concentration to lower concentration

B. Solvent molecules move from lower concentration to higher concentration

C. Solute molecules move from higher to lower concentration

D. Solute molecules move form lower to higher concentration

Answer: B

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146. Semipermeable membrane is that which permits the passage of :

A. Solute molecules only

B. Solvent molecules only

C. Solute and solvent molecues both

D. Neither solute nor solvent molecules

Answer: B

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147. Two solutions A and B are separated by semipermeable membrane. If liquid flows from A to B, than

A. A is less concentrated than B

B. A is more concentrated than B

C. Both have same concentration

D. Volume of A is more than that of B

Answer: A

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

A. Relative lowering of vapour pressure

B. Elevation of boiling point

C. Depression in freezing point

D. Osmotic pressure

Answer: D

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149. Which inorganic precipitate acts as semipermeable membrane ?

A. Calcium sulphate

B. Barium oxalate

C. Nickel phosphate

D. Copper ferrocyanide

Answer: D

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150. The solution in which the blood cells remain their normal shape, with regard to the blood, are

A. Isotonic

B. Isomotic

C. Hypertonic

D. Equinormal

Answer: A

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151. Isotonic solutions have same

A. Equal temperature

B. Equal osmotic pressure

C. Equal volume

D. Equal amount of solute

Answer: B

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152. Isotonic solutions have :

A. Density

B. Molar concentration

C. Normality

D. Molality

Answer: B

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153. The passing of solvent particles through semipermeable membrane is called:

A. Diffusion

B. Osmosis

C. Active absorption

D. Plasmolysis

Answer: B

Watch Video Solution

154. The osmotic pressure of solution increases if :

A. Temperature is decreased

B. Solution concentration is increased

C. Number of solute molecules is increased

D. Volume is increased

Answer: C

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155. At constant temperature , the osmotic pressure of a solution is __

A. Directly proportional to the concentration

B. Inversely proportional to the concentration

C. Directly proportional to the square of the concentration

D. Directly proportional to the square root of the concentration.

Answer: A

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156. As a result of osmosis the volume of the concentrated solution:

A. Increases the vapour pressure of water

B. Decreases the boiling point of water

C. Remains constant

D. Increases or decreases

Answer: A

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157. The excess pressure that is applied to the solution to prevent the passage of solvent into it through a semipermeable membrane is referred to as :

A. critical solution pressure

B. normal pressure of the solvent

C. Osmotic pressure of a solution

D. atomospheric pressure

Answer: C

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158. At low concentration the statement that equimolal solutions under a given set of experiment conditions have equal osmotic pressure is true for

A. All solutions

B. Solutions of non-electrolytes only

C. Solutions of electrolytes only

D. Colloidal solutions

Answer: B

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159. When mango is placed in 1N HCl solution, it

A. swells

B. shrinks

C. remains unchanged

D. bursts

Answer: B

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160. The concentration in gms per litre of a solution of cane sugar (M = 342) which is isotonic wih a solution containing 6 gms of urea (M = 60) per litreis

A. 3.42

B. 34.2

C. 5.7

D. 19

Answer: B

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161. Osmotic pressure of a solution is $0.0821atm$ at a temperature of 300 K. The concentration in mole/litre will be

A. 0.033

B. 0.066

C. 0.33×10^{-2}

D. 3

Answer: C

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

A. $P_1 > P_2 > P_3$

B. $P_3 > P_1 > P_2$

C. $P_2 > P_2 > P_3$

D. $P_2 > P_3 > P_1$

Answer: C

Watch Video Solution

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

A. 34.2

B. 171.2

C. 68.4

D. 136.8

Answer: C

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164. Osmotic pressrue of 0.4% urea solution is 1.64 atm and that of 3.42% cane sugar is 2.46 atm. When the above two solutions are mixed, the osmotic pressure of the resulting solution is

A. 1.64 atm

B. 2.46 atm

C. 2.06 atm

D. $0.82atm$

Answer: C

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165. The osmotic pressure of a solution is given by the relation

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

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

C. $\pi = \frac{RC}{T0}$

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

Answer: D

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166. The osmotic pressure of a solution is directly proportional to

A. The molecular concentration of solute

B. The absolute temperature at a given concentration

C. Van't Hoff Factor

D. All of the above.

Answer: D

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167. The osmotic pressure of a dilute solution is given by

A. $P = P_0 x$

B. $pV = NRT$

C. $\Delta P = P_0 N_2$

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

Answer: B

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

A. $P \propto \frac{1}{V}$ if T is constant

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

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

D. PV is constant if T is constant

Answer: C

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169. Molecular weight of biomolecules such as protein can be determined by _____ method.

A. Osmotic pressure measurement.

B. Depression in freezing point measurement

C. Elevation in boiling point meansurement

D. Vapour pressure meansurement.

Answer: A

View Text Solution

170. The osmotic pressure of a decimolar solution of $BaCl_2$ in water is

A. Inversely proportional to its Celsium temperature

B. Inversely proportional to its absolute temperature

C. Directly proportional to its Celsium temperature

D. Directly proportional to its absolutel temperature.

Answer: D

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171. If a 0.1 M solution of glucose (mol.wt. 180) and 0.1molar solution of urea (mol. wt. 60) are placed on the two sides of a semipermeable membrane to equal heights, then it will be correct to say

A. There will be on net movement across the membrane

B. Glucose will flow across the membrane into urea solution

C. Urea will flow across the membrane into glucose solution

D. Water will flow from urea solution two flucose solution.

Answer: A

View Text Solution

172. 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. Glucose and sodium chloride

B. Urea and glucose

C. Sodium chloride and urea

D. Water and sodium chloride

Answer: B

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173. The osmotic pressure of a solution at 273 K is 2.5 atm. Its osmotic pressure at 546 K under similar conditions will be :

A. $0.5atm$

B. $1.0atm$

C. $2.5atm$

D. 5.0 atm

Answer: D

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174. Equal volumes of M/20 urea solution and M/20 glucose solution are mixed. The mixture will have osmotic pressure :

A. equal to either of the solution

B. less than either of the solution

C. higher than neither of the solution

D. zero

Answer: A

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175. The osomotic pressure of a solution at $0^{\circ}C$ is $4atm$. What will be its osmotic pressure at $546K$ under similar conditions?

a.$4atm$, b.$9atm$,c.$8atm$, d.$6atm$

A. 8 atmospheres

B. 2 atmospheres

C. 8 atmospheres

D. 1atmosphere

Answer: C

Watch Video Solution

176. The osomotic pressure of a solution at $0^{\circ}C$ is $4atm$. What will be its osmotic pressure at $546K$ under similar conditions?

a.$4atm$, b.$9atm$,c.$8atm$, d.$6atm$

A. $0.5atm$

B. $2 \times 273atm$

C. 4 atm

D. $273/2atm$

Answer: C

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

A. Diffusion rate of the soluble

B. Ionic concentration

C. Elevation B.P.

D. Flow of solvent from a concentrate to a dilute solution.

Answer: B

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178. If O.P. of 1M of the following in water can be measured, which one will show the maximum O.P. ?

A. $AgNO_3$

B. $MgCl_2$

C. $(NH_4)_3PO_4$

D. Na_2SO_4

Answer: C

Watch Video Solution

179. Osmotic pressure of $0.1M$ solution of $NaCl$and $NaSO_4$will be

A. same boiling point but different freezing points

B. Osmotic pressure of NaCl solution will be more than Na_2SO_4 Solution

C. Osmotic pressure of Na_2SO_4 solution will be more than NaCl solution

D. Osmotic pressure of Na_2SO_4 solution will be less than that of NaCl Solution

Answer: C

Watch Video Solution

180. Which one has the higher osmotic pressure at same temperature ?

A. $M/10$ HCl

B. $M/10$ urea

C. $M/10 BaCl_2$

D. $M/10$ glucose

Answer: C

Watch Video Solution

181. In equimolar solution of glucose, NaCl and $BaCl_2$, the order of osmotic pressure at same temperature is as follow :

A. Glucose $>$ NaCl $>$ $BaCl_2$

B. NaCl $>$ $BaCl_2$ $>$ Glucose

C. $BaCl_2$ $>$ NaCl $>$ Glucose

D. Glucose $>$ $BaCl_2$ $>$ NaCl

Answer: C

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182. The osmotic pressure of which solution is maximum (consider that deci-molar solution of each 90% dissociated)

A. Aluminium sulphate

B. Barium chloride

C. Sodium Sulphate

D. A mixture of equal volumes of (b) and (c)

Answer: A

Watch Video Solution

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

A. $\pi \propto \frac{1}{V}$ if T is constant

B. $\pi \times V$ if T is constant

C. $\pi \propto V$ if V is constant

D. πV is constant if T is constant

Answer: B

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184. Vant Hoff factor (i)-

A. $\frac{\text{Normal molecular mass}}{\text{Observed molecular mass}}$

B. $\frac{\text{Observed molecular mass}}{\text{Normal molecular mass}}$

C. Less than one in case of dissociation

D. More than one in case of association

Answer: A

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185. The experimental molecular weight of an electrolyte will always be less than its calculated value because the value of Van't Hoff factor. $'i$, is:

A. Less than 1

B. Greater than 1

C. Equivalent tone

D. Zero

Answer: B

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186. Van't Hoff factor is _____.

A. less than one in case of dissociation

B. more than one in case of association

C. always less than one

D. less than one in case of association

Answer: D

Watch Video Solution

187. A substances associate in their solution as dimer (opr bimolecule) , then what will be the value of Van't Hoff factor i?

A. 0.2

B. 0.4

C. 0.5

D. Given all

Answer: C

View Text Solution

188. $0.6g$of a solute is dissolved in 0.1litre of a solvent which develops an osmotic pressure of 1.23 at m at $27^{\circ}C$.The molecular mass of the

substance is

A. $149.5gmol^{-1}$

B. $120gmol^{-1}$

C. $430gmol^{-1}$

D. $240gmol^{-1}$

Answer: B

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189. A solution containing 500 g of a protein per liter is isotonic with a solution containing 3.42 g sucrose per liter. The molecular mass of protein in 5 x 10^{x}, hence x is.

A. 5

B. 146

C. 34200

D. 50000

Answer: D

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190. Two solutions of KNO_3 and CH_3COOH are prepared separately. Molarity of both is $0.1M$ and osmotic pressure are P_1 and P_2 respectively. The correct relationship between the osmotic pressure is :

A. $P_2 > P_1$

B. $P_2 = P_1$

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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191. Twenty grams of a substance were dissolved in 500ml. Of water and the osmotic pressure of the solution was found to be 600mm of mercury at $15^{\circ}\mathrm{C}$. Determine the molecular weight of the substance.

A. 1000

B. 1200

C. 1400

D. 1800

Answer: B

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192. The osmotic pressure in atmosphere of $10\,\%$ solution of cane sugar at $69^{\circ}C$is

A. 724

B. 824

C. 8.21

D. 7.21

Answer: C

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193. The solution containing $4.0gm$ of a polyvinyl chloride polymer in 1 litre dioxane was found to have an osmotic pressure 6.0×10^{-4} atmosphere at $300K$,the value of R used is 0.082litre atmosphere $\text{mole}^{-1}K^{-1}$.The molecular mass of the polymer was found to be

A. 3.0×10^2

B. 1.6×10^5

C. 5.6×10^4

D. 6.4×10^2

Answer: B

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194. A solution of urea contains 8.6 g per litre. It is isotonic with 5% solution of a non-volatile solute. The molecular mass of the solute will be :

A. 348.9

B. 34.89

C. 3489

D. 861.2

Answer: A

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195. The osmotic pressure of a solution containing $40g$ of solute $(\text{molecular mass } 246)$ per litre at $27^\circ C$ is $\left(R = 0.0822 atm L mol^{-1}\right)$

A. $0.1 atm$

B. 0.2atm

C. 0.4atm

D. 0.8 atm

Answer: C

Watch Video Solution

196. A solution of glycol containing 1.82 $g/$ litre hasan osmotic pressure of51.8 cmof mercury at10°.What is the molecular weight of glycol?

A. 62.04

B. 70

C. 80

D. 100

Answer: A

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197. Osmotic pressure of a solution is $0.0821 atm$ at a temperature of 300 K. The concentration in mole/litre will be

A. 0.033

B. 0.066

C. 0.33×10^{-2}

D. 3

Answer: A

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198. The osmotic pressure of a solution (density is 1 g mL^{-1}) containing $3g$ of glucose (molecular weight =180) in $60g$ 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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199. If a $6.84\ \%$ (wt,vol.)solutionof 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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200. The molecular mass of $NaCI$ as determined by osmotic pressure measurement is

A. Same as theoretical value

B. Highter than theoretical value

C. Lower than theoretical value

D. Double than the theoretical value

Answer: C

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201. Van't Hoff factor of $Ca(NO_3)_2$ is

A. 1

B. 2

C. 3

D. 4

Answer: C

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202. The Van't Hoff factor calculated from association data is always _____ than calculated from dissociation date.

A. Less

B. more than one in case of association

C. Same

D. More or less

Answer: A

Watch Video Solution

203. Which one of the following solutions would exhibit abnormal osmotic pressure ?

A. Aqueous solution of urea

B. Aqueous solution of sucrose

C. Aqueous solution of glucose

D. Aqueous solution of common salt.

Answer: D

View Text Solution

204. Which of the following aqueous solutions will have the lowest freezing point ?

A. 1m glucose $(C_6H_{12}O_6)$

B. $1mNH_4Cl$

C. 1m sucrose $(C_{12}H_{22}O_{11})$

D. 1m $BaCl_2$

Answer: D

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205. Which of the following equation solution will have higher boiling point at1atm. Pressure ?

A. $1MFeCl_3$

B. $1MCaCl_2$

C. $1MKCl$

D. 1 M Urea $\left[CO(NH_2)_2\right]$

Answer: A

View Text Solution

206. Van't Hoff factor i is the ratio of

A. observed molar mass to theoretical molar mass

B. observed value of colligative property to theoretical value

C. theoretical molar mass to observed molar mass

D. theoretical value of colligative property to observed value

Answer: B

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207. The Van't Hoff factor (i) for 2.0 m aqueous glucose solution is

A. 0.2

B. 0.4

C. 0.6

D. 1.0

Answer: D

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208. Which of the following solution will have maximum lowering of vapour pressure ?

A. 1M NH_4NO_3

B. 1M $Ba(NO_3)_2$

C. 1 M Glucose

D. 1M Phenol

Answer: B

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209. Which of the following is false?

A. Molar mass of KNO_3 found by osmotic pressure measurement is half of the actual value

B. Molar mass of acetic acid is benzene found by freezing point measurement is double of the actual value

C. Osmotic pressure of 1M urea solution is half of that of 1M KCl solution

D. Molar mass of HCl found by osmotic pressure measurement will be same in the aqueous solution and benzene solution.

Answer: D

View Text Solution

210. The substance A when dissolved in solvent B shows the molecular mass corresponding to A_3. The vant Hoffs factor will be:

A. $\frac{1}{2}$

B. 1

C. 2

D. $\frac{1}{3}$

Answer: D

Watch Video Solution

211. Which of the following compounds corresponds to Van't Hoff factor (i) to be equal to 2 for dilute solution ?

A. Na_2SO_4

B. $KHSO_4$

C. Glucose

D. $CuSO_4$

Answer: D

Watch Video Solution

212. van't Hoff factor more than unity indicates that the solute in solution has

A. dissociated

B. associated

C. does not undergo any change

D. can't be predicted

Answer: A

Watch Video Solution

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

A. $Fe_2(SO_4)_3$

B. $NaNO_3$

C. $Ca(NO_3)_2$

D. K_2SO_4

Answer: A

Watch Video Solution

214. $\frac{M}{20}$ NaCl and $\frac{M}{20}CH_3COOH$ are kept in separate containers. If their osmotic pressure are P_1 and P_2 respectively . What is the correct statement ?

A. $P_1 = P_2$

B. $P_1 > P_2$

C. $P_2 > P_1$

D. $P_1 = P_2 =$ 1atm.

Answer: B

Watch Video Solution

215. Which among the following will show maximum osmotic pressure ?

A. 1M NaCl

B. 1M $CaCl_2$

C. $1M(NH_4)_3PO_4$

D. $1MK_2SO_4$

Answer: C

Watch Video Solution

216. Acetic acid exists in benzene solution in the dimeric form. In an actual experiment, the van't Hoff factor was found to be 0.52. Then, the degree of dissociation of acetic acid is

A. 0.48

B. 0.24

C. 0.96

D. 0.72

Answer: C

Watch Video Solution

217. The Van't Hoff factor for 0.1 M $CaCl_2$ solution is 2.74. The degree of dissociation is

A. $61\ \%$

B. 0.87

C. 1

D. 0.54

Answer: B

Watch Video Solution

218. Azotropic mixture are

A. those boil at different temperature

B. mixture of two solids

C. constant boiling mixtures

D. mixture of volatile and non-volatile liquids.

Answer: C

View Text Solution

219. Azotrops are

A. liquid mixture which distill unchanged in composition

B. liquids which can mix with each other in all proportion

C. solids which form solid solution of definite compositions

D. gases which can be separated

Answer: A

View Text Solution

220. In vaporisation of liquids into air, liquid dissolved into air, hence liquid is

A. solution

B. solute

C. solvent

D. mixture

Answer: B

View Text Solution

221. How much of NaOH is required to neutralise 1500 cm^3 of 0.1 M HCl?

A. 4g

B. 6g

C. 40g

D. 60g

Answer: B

Watch Video Solution

222. A mixture has 18 g water and 414 g ethanol . The mole fraction of water in mixture is (assume ideal behaviour of the mixture)_____.

A. 0.1

B. 0.4

C. 0.7

D. 0.9

Answer: A

Watch Video Solution

223. The molarity of a solution made by mixing 50 ml of conc. H_2SO_4 (18M) with 50 ml of water, is

A. 36M

B. 18M

C. 9M

D. 6M

Answer: C

Watch Video Solution

224. Which statement is true for solution of 0.020 M H_2SO_4 ?

A. 2 litre of the solution contains 0.20 mole of SO_4^{2-}

B. 2 litre of the solution contains 0.080 mole of H_3O^+

C. 1 litre of the solution contains 0.020 mole of H_3O^+

D. 1 litre of the solution contains 0.04 mole of SO_4^{2-}

Answer: B

Watch Video Solution

225. 5mL of $NHCI$, $20mL$ of $N/2H_2SO_4$ and 30 mL of $N/3HNO_3$ are mixed together and volume made to one litre. The normality of the resulting solution is

A. $\frac{N}{5}$

B. $\frac{N}{10}$

C. $\frac{N}{20}$

D. $\frac{N}{40}$

Answer: D

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226. A solution of $Al_2(So_4)_3\{d = 1.253gm/ml\}$ contain $22\,\%$ salt by weight. The molarity , normality and molality of the solution is

A. 0.805 M 4.83 N,0.825M

B. 0.825M, 48.3N, 0.803M

C. 4.83M,4.83N,4.83M

D. 4.83M,4.83N,8.25M'

Answer: A

Watch Video Solution

227. The mole fraction of water in $20\,\%\,(wt.\,/wt.\,)$ aqueous solution of H_2O_2 is:

A. $\frac{77}{68}$

B. $\frac{68}{77}$

C. $\frac{20}{80}$

D. $\frac{80}{20}$

Answer: B

Watch Video Solution

228. The weight of pure $NaOH$ required to prepare $250cm^3$ of $0.1N$ solution is

A. 4g

B. 1g

C. 2g

D. 10g

Answer: B

Watch Video Solution

229. The molality of 90% (w/v)H_2SO_4 solution is [density = 1.8 gm $/$ ml]

A. 0.102

B. 1.02

C. 10.2

D. 102

Answer: C

Watch Video Solution

230. Volume of water needed to mix with 10 mL 10N HNO_3 to get 0.1 N HNO_3 is :

A. 1000ml

B. 990ml

C. 1010ml

D. 10ml

Answer: B

Watch Video Solution

231. An aqueous solution of glucose is 10% in strength ,The volume in which 1g mole of it dissolved will be

A. 18 litre

B. 9 litre

C. 0.9 litre

D. 1.8 litre

Answer: D

Watch Video Solution

232. A solution contains 25% H_2O, 25% C_2H_5OH and 50% CH_3COOH by mass.The mole fraction of H_2Owould be

A. 0.25

B. 2.5

C. 0.503

D. 5.03

Answer: C

Watch Video Solution

233. A solution contains 1.2046×10^{24} hydrochloric acid molecules in one dm^3 of the solution. The strength of the solution is

A. 6N

B. 2N

C. 4N

D. 8N

Answer: B

Watch Video Solution

234. The density of NH_4OH solution is $0.6g/mL$. It contains 34% by weight of NH_4OH. Calculate the normality of the solution:

A. 4.8 N

B. 0.5 N

C. 10N

D. 5.8 N

Answer: D

Watch Video Solution

235. A sugar syrup of weight 214.2 grams contains34.2 grams of sugar.The molal concentration is :

A. 0.55

B. 5.5

C. 55

D. 0.1

Answer: A

View Text Solution

236. The volume of 0.25 MH_3PO_3 required to neutralise 25 ml of 0.03 M $Ca(OH)_2$ is

A. 20ml

B. 25 ml

C. 40 ml

D. 50ml

Answer: A

Watch Video Solution

237. Molarity of a solution prepared by dissolving 75.5g of pure KOH in 540 ml solution is

A. 2.51M

B. 2.4 M

C. 2.496M

D. 2.41 M

Answer: C

Watch Video Solution

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

A. Solute molecules and solvent molecules

B. Solute molecules and the total molecules in the solution

C. Solvent molecules and the total molecules in the solution

D. Solvent molecules and the total number of ions of the solute.

Answer: B

Watch Video Solution

239. The vapour pressure lowering caused by addition of 100 g of sucrose (molecular mass = 342) to 1000 g of wate,if the vapour pressure of pure water at $25^{\circ}C$ is 23.8mm Hg,is

A. 1.25 mm Hg

B. 0.125 mm H g

C. 1.15 mm Hg

D. 00.12 mm Hg

Answer: B

Watch Video Solution

240. The vapour pressure of two liquids 'P' and 'Q' are 80 and 60 torr respectively. The total vapour pressure of solution obtained by mixing 3 mole of P and 2 mol of Q would be

A. 140 torr

B. 20 torr

C. 68 torr

D. 72 torr

Answer: D

Watch Video Solution

241. The vapour pressure of water at $20^{\circ}Cis17.54mm$. When 20g of non - ionic substance is dissolved in 100g of water, the vapour pressure is lowered by $0.30mm$. What is the molecular mass of the substance ?

A. 210.2

B. 206.88

C. 215.2

D. 200.8

Answer: A

Watch Video Solution

242. Benzene and toluene form nearly ideal solution. At $20^{\circ}C$ the vapour pressure of benzene is 75 torr and that of toluene is 22 torr. The partial vapour pressure of benzene at $20^{\circ}C$ for a solution containing 78g of benzene and 46 g of toluene in torr is-

A. 50

B. 25

C. 37.5

D. 53.5

Answer: A

Watch Video Solution

243. The vapour pressure of a solvent decreased by 10 mm of Hg when a non-volatile solute was added to the solvent. The mole fraction of solute in solution is 0.2, what would be the mole fraction of solvent if the decrease in vapour pressure is 20 mm of Hg?

A. 0.8

B. 0.6

C. 0.4

D. 0.2

Answer: B

Watch Video Solution

244. At $40^{\circ}C$ the vapour pressure of pure liquids, benzene and toluene, are $160mmHg$ and $60mmHg$ respectively. At the same temperature, the vapour pressure of an equimolar solution of the liquids, assuming the ideal solution will be:

A. 140 mm H

B. 110 mm Hg

C. 220 mm Hg

D. 100 mm Hg

Answer: B

Watch Video Solution

245. Increasing the temperature of an aqueous solution wil case

A. Decrease in molality

B. Decreasing in molarity

C. Decrease in mole fraction

D. Decrease in %w / w

Answer: B

Watch Video Solution

246. Vapour pressure of CCL_4 at $25^\circ C$ is 143 mmHg 0.05g of a non-volatile solute (mol.wt.=65)is dissolved in $100 ml CCL_4$. find the vapour pressure of the solution (density of $CCL_4 = 158 g/cm^2$)

A. 141.43mm

B. 94.39mm

C. 199.34mm

D. 143.99mm

Answer: A

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247. Pressure cooker reduces cooking time because :

A. Heat is more evenly distributed in the cooking space

B. Boiling point ofwater involved in cooking is increased

C. The higher pressure inside the cooker crushes the food material.

D. Cooking involves chemical changes helped by arise in temperature

Answer: B

Watch Video Solution

248. The molal boiling point constant for water is$0.513^\circ Ckgmol^{-1}$. When 0.1mole of sugar is dissolved in 200ml of water , the solution boils under a pressure of one atmosphere at

A. $100.513^\circ C$

B. $100.0513^\circ C$

C. $100.256^\circ C$

D. $101.025^\circ C$

Answer: C

Watch Video Solution

249. An aqueous solution containing 1g of urea boils at $100.25^\circ C$. The aqueous solution containing 3g of glucose in the same volume will boil be

A. $100.75^\circ C$

B. $100.5^\circ C$

C. $100.25^\circ C$

D. $100^\circ C$

Answer: C

Watch Video Solution

250. At the higher altitudes the boiling point of water lowers because

A. Atmospheric pressure is low

B. Temperature is low

C. Atmospheric pressure is high

D. Temperature is high

Answer: A

Watch Video Solution

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

A. Inter-molecular forces

B. Potential energy

C. Total energy

D. Kinetic energy

Answer: D

Watch Video Solution

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

Watch Video Solution

253. Which of the following aqueous molal solution have highest freezing point

A. Urea

B. Barium chloride

C. Potassium bromide

D. Aluminium sulphate

Answer: A

Watch Video Solution

254. If glycerol and methanol were sold at the same price in the market, which would be cheaper for perparing an antifreeze solution for the radiator of an automobile ?

A. glycerol

B. methanol

C. both equal

D. cannot predict

Answer: B

Watch Video Solution

255. The freezing point of a solution prepared from $1.25g$ of non-electrolyte and $20g$ of water is $271.9K$. If the molar depression constant is $1.86Kmol^{-1}$, 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

256. A solution of urea boils at $100.18^{\circ}C$ at the atmospheric pressure. If K_f and K_b for water are 1.86 and $0.512Kkgmol^{-1}$ respectively, the above solution will freeze at,

A. $-6.54^{\circ}C$

B. $6.54^{\circ}C$

C. $0.654^{\circ}C$

D. $-0.654^{\circ}C$

Answer: D

Watch Video Solution

257. How much polystrene of molar mass 9000 g mol^{-1} would have to be dissolved in 100 g of C_6H_6 to lower its freezing point by $1.05K$?

A. 19.3 gm

B. 193 gm

C. 38.6 gm

D. 77.2 gm

Answer: B

Watch Video Solution

258. Blood has been found to be isotonic with

A. Normal saline solution

B. Saturated NaCl solution

C. Saturated KCl Solution

D. Saturated solution of a $1:1$ mixture of NaCl and KCl

Answer: A

Watch Video Solution

259. 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. Sugar beet will absorb water from solution

C. Sugar beet will neither absorb nor lost water

D. Sugar beet will dissolve in solution

Answer: A

Watch Video Solution

260. Which of the following associated with isotonic solution is not correct ?

A. They will have the same osmotic pressure

B. They have the same weight concentration

C. Osmosis does not take place when the two solutions are separated by as semipermeable membrane

D. They will have the same vapour pressure.

Answer: B

View Text Solution

261. If 3g of glucose (molecular mass 180) is dissolved in 60g of water at $15^{\circ}C$, then the osmotic pressure of this solution will be :

A. 0.34 atm

B. 0.36 atm

C. 6.570 atm

D. 5.57 atm.

Answer: C

Watch Video Solution

262. The osmotic pressure of a solution containing $0.1 mol$ of solute per litre at $273 K$ is

A. $\frac{0.1}{1} \times 0.0821 \times 273$

B. $0.1 \times 1 \times 0.0821 \times 273$

C. $\frac{1}{0.1} \times 0.0821 \times 273$

D. $\frac{0.1}{1} \times \frac{273}{0.0821}$

Answer: A

Watch Video Solution

263. The osmotic pressure of a $5\ \%\ (weight/volume)$ solution of cane sugar at $150^\circ C$ is

A. 2.45 atm

B. 5.078 atm

C. 3.4 atm

D. 4 atm

Answer: B

Watch Video Solution

264. A solution of sucrose (molar mass = 342 g/mol) is prepared by dissolving 68.4 g of it per litre of solution, what is its osmotic pressure at 273 K?

$\left(R = 0.081 L atm K^{-1} mol^{-1}\right)$

A. 6.02 atm

B. 4.92 atm

C. 4.04atm

D. 5.32 atm.

Answer: B

Watch Video Solution

265. Osmotic pressure of a urea solution at $10^{\circ}C$ is 500 mm. Osmotic pressure of the solution become 105.3 mm. When it is diluted and temperature raised to $25^{\circ}C$.The extent of dilution is

A. 6 Times

B. 5 Times

C. 7 Times

D. 4 Times

Answer: B

Watch Video Solution

266. Assuming the salts to be unionised in solution, which of the following has highest osmotic pressure ?

A. 1% CsCl

B. 1% RbCl

C. 1% KCl

D. 1% NaCl

Answer: D

Watch Video Solution

267. A solution containing $4g$ of a non-volatile organic solute per $100mL$ was found to have an osmotic pressure equal to $500cm$ 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

268. The osmotic pressure of a sugar solution at $24^{\circ}C$ is $2.5atm$. The concentration of the solution in mole per litre is

A. 10.25

B. 1.05

C. 1025

D. 0.1025

Answer: D

Watch Video Solution

269. Which compound corresponds vant Hoff factor (i) to be equal to 2 in dilute solution:

A. K_2SO_4

B. $NaHSO_4$

C. Sugar

D. $MgSO_4$

Answer: D

Watch Video Solution

270. The Van't Hoff factor i for a 0.2 molal aqueous solution of urea is

A. 0.2

B. 0.1

C. 1.2

D. 1.0

Answer: D

Watch Video Solution

271. The molar mass of NaCl determined by colligative property measurement will be

A. equal to 58.5

B. > 58.5

C. < 58.5

D. can't be measured

Answer: C

Watch Video Solution

272. The depressions in freezing point for 1 M urea, 1 M glucose and 1M NaCl are in the ration :

A. $1:1:2$

B. $3:2:2$

C. $2:1:1$

D. $1:1:1$

Answer: A

Watch Video Solution

273. 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. 0.7

B. 0.358

C. 0.835

D. 0.6

Answer: C

Watch Video Solution

274. If osmotic pressure of 1M urea is π , what will be the osmotic pressure for 0.1 M NaCl?

A. π

B. 0.02π

C. 2π

D. 0.2π

Answer: D

Watch Video Solution

275. The degree of dissociation (α) of a weak electrolyte A_xB_y is related to van't Hoff factor (i) by the expression

A. $\alpha = \dfrac{i-1}{(x+y-1)}$

B. $\alpha = \dfrac{x+y-1}{(i-1)}$

C. $\alpha = \dfrac{i-1}{x+y+1}$

D. $\alpha = \frac{x + y + 1}{i - 1}$

Answer: A

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276. The concentration of Ca^{2+} ion in a sample of water is 0.0002 M then what would be the concentration ofCa^{2+} in ppm by weight-volume?

(Atomic wt. of Ca= 40 gm / mole)

A. 4

B. 8

C. 0.08

D. 0.4

Answer: B

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277. What will be the ratio of any colligative propertiesof 1.0 m aqueous solutions of NaCl,Na_2SO_4 and $K_4[Fe(CN)_6]$ [Assume that solute complete (100%) dissociates in the solution]

A. $2:3:4$

B. $1:2:4$

C. $2:3:5$

D. $1:3:5$

Answer: C

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278. In binary ideal solution forms by liquid A and B, at constant temperature, mole -fraction of liquid A in vapour state is 0.4 and its partial vapour pressure is 400 mm,then what will be the partial vapour pressure of B ?

A. 600 mm

B. 300 mm

C. 500 mm

D. 200 mm

Answer: A

Watch Video Solution

279. At constant temperature ,osmotic pressure of an aqueous solution of 1.5 M NH_4NO_3 and x $NAl_2(SO_4)_3$ are equal, then mention the value of X. (Assume that ionic solid substances completely dissociates in the solution .)

A. 0.1

B. 3.6

C. 1.2

D. 0.5

Answer: B

View Text Solution

280. Boiling point of the aqueous solution prepared by dissolving 1.5 mole substances in 1000gm water at 1 atmosphere pressure is $100.5^{\circ}C$, then which of the following alternative is correct for the solution ?

($K_b = 0.512 Kkgmole^{-1}$)

A. i = 1

B. $1 < i < 2$

C. $i < 1$

D. $i > 2$

Answer: C

Watch Video Solution

281. At constant temperature , in a closed vessel, an ideal solution is formed by liquid-A and liquid -B and mole fraction of A and B are0.6 and 0.4 respectively. If vapour pressure of pure liquids are 125.0 and 62.5 mm respectively, then their mole fraction in vapour state are respectively (In vessel, no other component is in gaseous form.)

A. 0.6 and 0.4

B. 0.4 and 0.6

C. 0.25 and 0.75

D. 0.75 and 0.25

Answer: D

Watch Video Solution

282. Difference in boiling point and freezing point of 10kg aqeous solution of urea is $100.2372^{\circ}C$,then what quantity of urea dissolved in

the solution ?

($K_b = 0.512^\circ C$ and $K_f = 1.86^\circ C$ kg $mole^{-1}$)

A. 60

B. 38.946

C. 51.65

D. 40.5

Answer: A

Watch Video Solution

283. What amount of urea dissolved in 1 kg water at constant temperature ,so that vapour pressure of the solution reduced by 2% ? (MV of urea= 60 gm / mole)

A. 68 gm

B. 60gm

C. 50 gm

D. 75 gm

Answer: A

View Text Solution

284. Decrease in vapour pressure of an aqueous solution of an electrolyte is4%. What would be the percentage increase in elevation in boiling point ? ($K_b = 0.512 K \text{kg } mol^{-1}$)

A. 0.0055

B. 0.0002

C. 0.055

D. 0.02

Answer: A

View Text Solution

285. Solubility of sodium sulphate in water

A. increases with increase in temperature

B. decreases with increase in temperature

C. decreases with decrease in temperature

D. independent of temperature

Answer: B

View Text Solution

286. Dissolution of calcium chloride in water is exothermic process while that of ammonium nitrate is endothermic process, the observation is

A. Solubility of calcium chloride decreases with increase in temperature and that of ammonium nitrate increases with increase in temperature

B. Solubilities of both decreases with increase in temperature

C. Solubilities of both increases with increase in temperature

D. Solubilities of calcium chloride increases with increase in temperature and that of ammonium nitrate decrease with increase in temperature

Answer: A

View Text Solution

287. The freezing point of equimolal soution will be highest for :

A. $C_6H_5NH_3Cl$ (aniline hydrochloride)

B. $Ca(NO_3)_2$

C. $La(NO_3)_3$

D. $C_6H_{12}O_6$(glucose)

Answer: D

Watch Video Solution

288. A 0.2 molar aqueous solution of a weak acid (HX) is $20\,\%$ ionised . The freezing point of the solution is:

$(Given: K_f = 1.86^\circ Ckg \quad mol^{-1} \text{ for water})$

A. -0.45

B. -0.90

C. -0.31

D. -0.53

Answer: A

Watch Video Solution

289. During depression of freezing point in a solution, the following are in equilibrium:

A. Liquid solvent, solid solvent

B. Liquid solvent, solid solute

C. Liquid solute, solid solute

D. Liquid solute, solid solvent

Answer: A

Watch Video Solution

290. When 20 g of naphthoic acid $(C_{11}H_8O_2)$ is dissolved in 50 g of benzene $(K_f = 1.72 K \text{kg} mol^{-1})$, a freezing point depression of 2 K is observed. The Van't Hoff factor (i) is :

A. 0.5

B. 1

C. 2

D. 3

Answer: A

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291. Freezing point of an aqueous solution is $-0.186^{\circ}C$. Elevation of boiling point of the same solution is .....if $K_b = 0.512 K \text{molality}^{-1}$and $K_f = 1.86 K \text{molality}^{-1}$:

A. $0.186^{\circ}C$

B. $0.0512^{\circ}C$

C. $0.092^{\circ}C$

D. $0.2372^{\circ}C$

Answer: B

Watch Video Solution

292. 6.02×10^{21} molecules of urea are present in 100ml of its solution. The concentration of urea solution is

A. 0.001M

B. 0.1 M

C. 0.02M

D. 0.01M

Answer: D

Watch Video Solution

293. If α is the degree of dissociation of Na_2SO_4 the van't Hoff's factor (i) used for calculating the molecular mass is

A. $1+\alpha$

B. $1-\alpha$

C. $1+2\alpha$

D. $1-2\alpha$

Answer: C

Watch Video Solution

294. Density of $2.05M$ solution of acetic acid in water is $1.02g/mL$. The molality of same solution is:

A. $1.14mol/kg$

B. $3.28mol/kg$

C. $2.28mol/kg$

D. $0.44mol/kg$

Answer: C

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295. A $5.25\ \%$ solution of a substance is isotonic with a $1.5\ \%$ solution of urea (molar mass $= 60gmol^{-1}$) in the same solvent. If the densities of both the solutions are assumed to be equal to $1.0gcm^{-3}$, molar mass of the substance will be:

A. $90.0 gmol^{-1}$

B. $115.0 gmol^{-1}$

C. $105.0 gmol^{-1}$

D. $210.0 gmol^{-1}$

Answer: D

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296. Two liquids X and Y form an ideal solution. At 300K, vapour pressure of the solution containing 1 mol of X and 3 mol of Y is 550 mm Hg. At the same temperature, if 1 mol of Y is further added to this solution, vapour pressure of the solution increases by 10 mm Hg. Vapour pressure (in mmHg) of X and Y in their pure states will be, respectively

A. 200 and 300

B. 300 and 400

C. 400 and 600

D. 500 and 600

Answer: C

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297. A solution containing 2.675 g of $CoCl_3.6NH_3$ (molar mass = 267.5 g mol^{-1} is passed through a cation exchanger. The chloride ions obtained in solution are treated with excess of $AgNO_3$ to give 4.78 g of AgCl (molar mass = 143.5 g mol^{-1}). The formula of the complex is (At.mass of Ag = 108 u) .

A. $\left[Co(NH_3)_6\right]Cl_3$

B. $\left[CoCl_2(NH_3)_4\right]Cl$

C. $\left[CoCl_3(NH_3)_3\right]$

D. $\left[CoCl(NH_3)_5\right]Cl_2$

Answer: A

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298. If sodium sulphate is considered to be completely dissociated into cations and anions in aqueous solution , the change in freezing point of water $\left(\Delta T_f\right)$ when 0.01 mole of sodium sulphate is dissociated in 1 kg of water is : ($K_f = 1.86$ K kg mol^{-1})

A. 0.0372 K

B. 0.0558K

C. 0.0744K

D. 0.0186 K

Answer: B

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299. The degree of dissociation (α) of a weak electrolyte, A_xB_y is related to van't Hoff's factor (i) by the expression:

A. $\alpha = \frac{i-1}{x+y+1}$

B. $\alpha = \frac{x+y-1}{i-1}$

C. $\alpha = \frac{x+y+1}{i-1}$

D. $\alpha = \frac{i-1}{x+y-1}$

Answer: D

Watch Video Solution

300. A 5.2 molal aqueous of methyl alcohol, CH_3OH, is supplied. What is the molefraction of methyl alcohol in the solution ?

A. 0.19

B. 0.086

C. 0.05

D. 0.1

Answer: B

Watch Video Solution

301. The density of a solution prepared by dissolving 120 g of urea (mol. Mass=60 u) in 1000 g of water is 1.15 g/mL. The molarity if this solution is

A. 0.50 M

B. 1.78 M

C. 1.02M

D. 2.05 M

Answer: D

Watch Video Solution

302. K_f for water is $1.86 K kg mol^{-1}$. IF your automobile radiator holds $1.0 kg$ of water, how many grams of ethylene glycol $(C_2H_6O_2)$ must you add to get the freezing point of the solution lowered to $-2.8^\circ C$?

A. 72 g

B. 93 g

C. 39 g

D. 27 g

Answer: B

Watch Video Solution

303. What will be the molality of a solution of glucose in water which is 10% w / W ?

A. 0.01m

B. 0.617 m

C. 0.668m

D. 1.623m

Answer: B

Watch Video Solution

304. Calculate the percentage composition of a solution obtained by mixing 200 g of a $20\ \%$ and 300 g of a $30\ \%$ solution by weight.

A. 0.64

B. 0.5

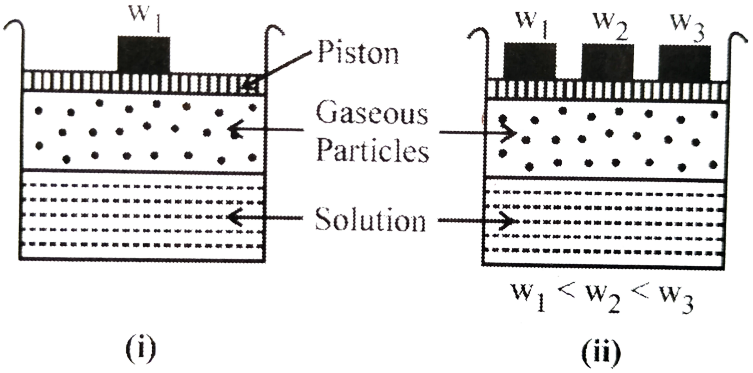
C. 0.28

D. 0.24

Answer: D

Watch Video Solution

305. Consider the two figures given below :



Which of the following statements regarding the experiment is true ?

A. The solubility of a gas in liquid in beaker (i) is greater than that in beaker (ii)

B. The solubility of a gasin beaker (i) is less than that in beaker (ii)

C. The solubility of a gas is equal in both beakers

D. The solubility of a gas remains unaffected by change in weights

Answer: B

Watch Video Solution

306. How many Na^+ ions are present in 100 mL of 0.25 M of NaCl solution ?

A. 0.025×10^{23}

B. 1.505×10^{22}

C. 15×10^{22}

D. 2.5×10^{23}

Answer: B

Watch Video Solution

307. What are the conditions for an ideal solution which obeys Raoult's law over the entire range of concentration ?

A. $\Delta_{mix}H = 0, \Delta_{mix}V = 0, P_{Total} = p_A^0 x_A + p_B^0 x_B$

B. $\Delta_{mix}H = +ve, \Delta_{mix}V = 0, P_{Total} = p_A^0 x_A + p_B^0 x_B$

C. $\Delta_{mix}H = 0, \Delta_{mix}V = +ve, P_{Total} = p_A^0 x_A + p_B^0 x_B$

D. $\Delta_{mix}H = 0, \Delta_{mix}V = 0, P_{Total} = p_B^0 x_B$

Answer: A

Watch Video Solution

308. Which of the following solutions is an example of negative deviation from Raoult's law ?

A. Acetone + Ethanol

B. Carbon tetrachloride + Chloroform

C. Acetone + Chloroform

D. Water + Ethanol

Answer: C

Watch Video Solution

309. Which of the following solutions shows positive deviation from Raoult's law ?

A. Acetone $+$ Aniline

B. Acetone $+$ Ethanol

C. Water $+$ Nitric acid

D. Chloroform $+$ Benzene

Answer: B

Watch Video Solution

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

A. $Al_2(SO_4)_3$

B. $AlCl_3$

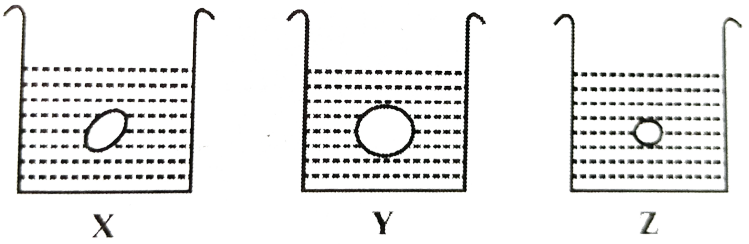
C. $Al(NO_3)_3$

D. $Al(OH)_3$

Answer: A

Watch Video Solution

311. Grapes are placed in three beakers beakers X,Yand Zcontaining different type of solutions are shown in figures.



If beaker X contains water, Y and Z contain

A. Y-hypotonic solution,Z-hypertonic solution

B. Y-hypertonic solution,Z-hypotonic solution

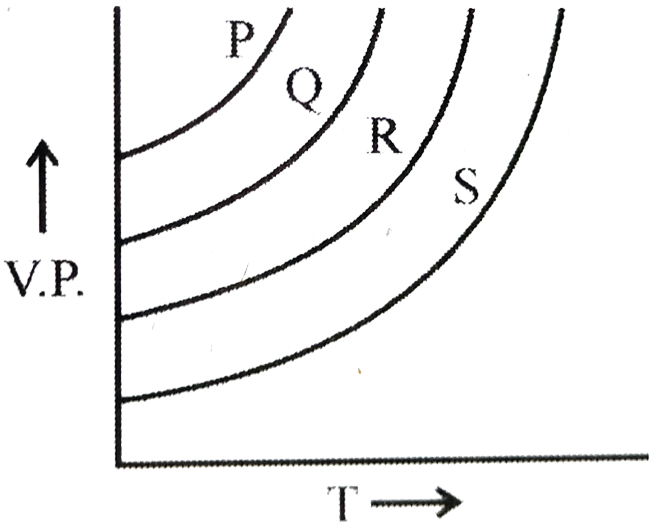
C. Y andZ-isotonic solutions

D. Y and Z -hypotonic solutions

Answer: A

View Text Solution

312. The given graph shows the vapour pressure -temperature curves for some liquids.Liquids P,Q,R and S respectively are



A. diethyl ether, acetone , ethyl alcohol,water

B. acetone, ethyl alcohol, diethyl ether, water

C. water, ethyl alcohol, acetone, diethyl ether

D. ethyl alcohol, acetone, diethyl ether,water

Answer: A

Watch Video Solution

313. Express the terms representing the following formulae .

(i) $\frac{\text{No. of moles of solute}}{\text{Volume of solution in litres}} = (W)$

(ii) $\frac{\text{No. of moles of solute}}{\text{Mass of solvent in kg}} = (X)$

(iii) $\frac{\text{No. of moles of component}}{\text{Moles in the solution}} = (Y)$

(iv) $\frac{\text{Mass of component}}{\text{Mass of solution}} = (Z)$

A. Molality ,Molarity,Mass fraction,Mole fracton

B. Molarity, Molality , Mass fraction ,Mole fraction

C. Molarity,Molality , Mole fraction,Mass fraction

D. Molality , Molarity ,Mole fraction,Mass fraction

Answer: C

Watch Video Solution

Watch Video Solution

314. Relative lowering of vapour pressure , osmotic pressure of a solution and elevation in boiling points are __(p)___ properties. Osmosis is the passage of __(q)__ through a semipermeable membrane from a solution of __(r)__ towards a solution of __(s)__ . Osmotic pressure is equivalent to mechanical pressure which must be applied on __(t)__ to prevent osmosis. In the above paragraph p,q,r,s and t respectively are

A. colligative, solution, higher concentration ,lower concentration , solution

B. colligative, solvent,higher concentration, lower concentration, solution

C. colligative,solution, lower concentration,higher concentration, solvent

D. colligative ,solvent,lower concentration, higher concentration , solution

Answer: D

Watch Video Solution

315. A solute X when dissolved in a solvent associates to form a pentamer. The value of van't Hoff factor (i) for the solute will be

A. 5

B. 0.5

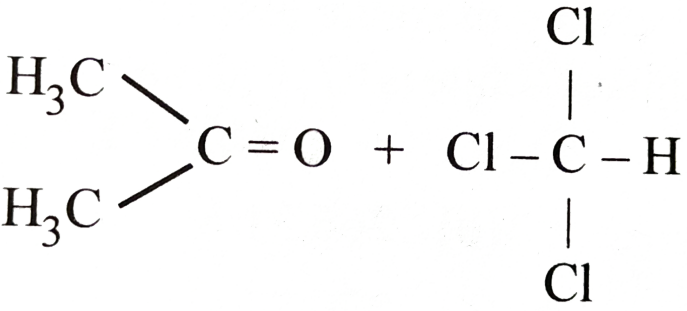
C. 0.2

D. 0.1

Answer: C

Watch Video Solution

316. When acteone and chloroform are mixed together, which of the following observations is correct ?



(A) (B)

A. A-A and B-B interactions ares stronger than A-B interactions

B. A-A and B-B interactions are weaker than A-B interactions

C. A-B,B-B and A-B interactions are equal

D. The liquids form separate layers and are immiscible

Answer: B

View Text Solution

317. Intermolecular forces between n-hexane and n-heptane are nearly same as between hexane and heptane individually. When these two are mixed, which of the following is not true about the solution formed ?

A. It obeys Raoult's Law,

i.e., $p_A = x_A p_A^0$ and $p_B = x_B p_B^0$

B. ΔH_{mixing} is zero

C. ΔV_{mixing} is zero

D. If forms minimum boiling azeotrope

Answer: D

Watch Video Solution

318. Which of the following statements is not correct ?

A. Osmotic pressure$(\pi)$of a solutioni is given by the relation π= MRT

where M is the molarity of the solution

B. The correct order of osmotic pressure for 0.2M aqueous solution of

each solute is $CaCl_2 > NaCl > CH_3COOh >$ glucose

C. Two solutions of sucrose of same molality prepared in different solvents will have same elevation in boiling point

D. Relative lowering in vapour pressure of a solution containingnon-volatile solute is directly proportional to mole fraction of solution is Raoult's law

Answer: C

Watch Video Solution

319. 1 mole of $\left[OH^{-}\right]$ is present in how many moles ofH_2O ?

A. 0.1 mole

B. $1dm^3$

C. 1 mole

D. 0.5 mole

Answer: C

Watch Video Solution

320. Which of the following experimental methods is adopted to determine osmotic pressure?

A. Berkeley Hartley's method

B. Beckmann method

C. Landsberger Walker method

D. Ostwald's Walker method

Answer: A

Watch Video Solution

321. $K_f = 1.82 K kg mol^{-1}$, 80 g of solute dissolved in 400 g water, molecular weight of solute is 62.Calculate freezing point of solution.

A. 268.31K

B. 266.31K

C. 267.28K

D. 270.31K

Answer: C

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322. Centimolar solution has volume $6dm^3$. Calculate its number of moles.

A. 0.06

B. 0.006

C. 0.6

D. 6

Answer: A

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323. Which is independent of temperature ?

A. Density

B. Normality

C. Molarity

D. Molality

Answer: D

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324. The volume of 2N H_2SO_4 solution is $0.1dm^3$. The volume of its decinormal solution (in dm^3) will be

A. $2dm^3$

B. $4dm^3$

C. $6dm^3$

D. $8dm^3$

Answer: A

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325. Molality of NaOH is 1.25. Percent by weight of NaOH is

A. 4.76

B. 0.05

C. 0.055

D. 0.06

Answer: A

Watch Video Solution

326. The number of hydroxyl ions in $10cm^3$ of 0.2 M HCl solution is

A. 3×10^{-12}

B. 6.023×10^{12}

C. 3×10^{8}

D. 3×10^{10}

Answer: C

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327. Which is not a colligative property?

A. Osmotic pressure

B. Freezing point

C. Elevation in boiling point

D. Relative lowering of vapour pressure

Answer: B

Watch Video Solution

328. Maximum depression in freezing point is caused by

A. Na_2SO_4

B. NaCl $>$ $BaCl_2$ $>$ Glucose

C. Glucose

D. KCl

Answer: A

View Text Solution

329. Find molality of solution containing 450 mg of glucose in 100 g solvent.

A. 2.5

B. 0.25

C. 0.025

D. 0.0025

Answer: C

Watch Video Solution

330. Calculate molal elevation constant for a solution containing 1.5 g solute dissolved in 250g g solvent,having elevation of boiling point 0.01. [molecular wt. = 60]

A. 0.1

B. 0.01

C. 0.5

D. 0.005

Answer: A

Watch Video Solution

331. $25cm^3$ of 0.02 M H_2SO_4 is diluted to $0.5dm^3$. Find molarity of diluted solution

A. 0.1

B. 0.01

C. 0.001

D. 0.0001

Answer: C

Watch Video Solution

332. 9 gm of glucose and 90 gm ofH_2O are mixed. Find the relative lowering of vapour pressure .[Given Molar mass of glucose = 180, Molar mass of $H_2O = 18$]

A. 0.009

B. 0.09

C. 0.18

D. 0.9

Answer: A

Watch Video Solution

333. What volume of $2MH_2SO_4$ is required to from 0.2 N of 100 mL of solution ?

A. 100ml

B. 50ml

C. 25ml

D. 5 ml

Answer: D

Watch Video Solution

334. 0.25 M of a solution in $5dm^3$ will give

A. 1.25 moles

B. 9.25 moles

C. 6.25 moles

D. 0.925 moles

Answer: A

Watch Video Solution

335. 0.2 M aqueous solution of NaOH (Mole mass =40) .Find mole fraction of NaOH.

[Given : Density of solution = 1 kg $/dm^3$]

A. 3.6×10^{-3}

B. 3.6×10^{-4}

C. 3.6×10^{-6}

D. 3.6×10^{-7}

Answer: A

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336. The osmotic pressure of a solution at 273 K is 2.5 atm. Its osmotic pressure at 546 K under similar conditions will be :

A. 0.5 atm

B. 1.0 atm

C. 2.5atm

D. 5.0atm

Answer: D

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337. The volumes of $4NHCI$ and $10NHCI$ required to make 1 litre of $6NHCI$ are

A. 0.75 litre of 10 HCl and 0.25 litre of 4 N HCl

B. 0.25 litreof 4 N HCl and0.75 litre of 10 N HCl

C. 0.67 litre of 4 N HCl and 0.33 litre of10 N HCl

D. 0.80 litre of 4 N HCl and 0.20 litre of 10 N HCl

Answer: C

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338. The number of moles of KCI in 1000 mL of 3M solution is _____.

A. 1

B. 2

C. 3

D. 1.5

Answer: C

Watch Video Solution

339. Colligative properties are used for the determination of _____.

A. Molar mass

B. Equivalent of molecules

C. Arragement of molecules

D. Melting point and boiling point

Answer: A

Watch Video Solution

340. $1.0g$ of non-electrolyte solute dissolved in $50.0g$ of benzene lowered the freezing point of benzene by $0.40K$. The freezing point depression constant of benzene is $5.12kgmol^{-1}$. Find the molecular mass of the solute.

A. $256gmol^{-1}$

B. $2.56gmol^{-1}$

C. $512 \times 10^3 gmol^{-1}$

D. $2.56 \times 10^4 gmol^{-1}$

Answer: A

Watch Video Solution

341. 10 mL of concentrated H_2SO_4 (18M) is diluted to one litre. The approximate strength of the dilute acid is-

A. 0.18 N

B. 0.09N

C. 0.36N

D. 1800N

Answer: C

Watch Video Solution

342. 6.02×10^{20} molecules of urea are present in 100 mL of its solution.

The concentration of urea solution is

(Avogadro constant, $N_A = 6.02 \times 10^{23} mol^{-1}$)

A. 0.02M

B. 0.01M

C. 0.001M

D. 0.1M

Answer: B

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343. The vapour pressure of ethyl alcohol and methyl alcohol are 45mm and 90 mm. An ideal solution is formed at the same temperature by mixing 60g of C_2H_5OH with 40g of CH_3OH. Total vapour pressure of the solution is approximately.

A. 67 mm

B. 35 mm

C. 105 mm

D. 140 mm

Answer: A

Watch Video Solution

344. Which is not a colligative property ?

A. Optically activity

B. Elevation of boiling point

C. Osmotic pressure

D. Lowering of vapour pressure

Answer: A

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345. The rise in boiling point of a solution containing $1.8g$ glucose in $100g$ of a solvent is $0.1^{\circ}C$. The molal elevation constant of the liquid is-

A. $0.01k/m$

B. $0.1k/m$

C. $1\frac{k}{m}$

D. $10k/m$

Answer: C

Watch Video Solution

346. Van't Hoff "i" factor for $ZnCl_2$ is

A. 5

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

347. A solution contains 1 mole of water and4 mole of ethanol. The mole fraction of water and ethanol will be

A. 0.2 water $+$ 0.8 ethanol

B. 0.4 water $+$ 0.6 ethanol

C. 0.6 water + 0.8 ethanol

D. 0.8 water + 0.2ethanol

Answer: A

Watch Video Solution

348. If osmotic pressure of a solution is 2 atm at $0^\circ C$, then at 546K , the osmotic pressure is

A. 0.5 atm

B. 1 atm

C. 2 atm

D. 4 atm

Answer: D

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349. The molal depression constant depends upon

A. nature of the solute

B. nature of the solvent

C. heat of solution of the solute in the solvent

D. vapour pressure of the solution

Answer: B

Watch Video Solution

350. The equation that represents general van't Hoff equation is

A. $\pi = \frac{n}{V}RT$

B. $\pi = nRT$

C. $\pi = \frac{V}{n}RT$

D. $\pi = nVRT$

Answer: A

Watch Video Solution

351. 5.0 g of sodium hydroxide (molar mass 40 g mol^{-1}) is dissolved in little quantity of water and the molarity of the resulting solution?

A. $0.1 mol / dm^3$

B. $1.0 mol / dm^3$

C. $0.125 mol / dm^3$

D. $1.25 mol / dm^3$

Answer: D

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

A. Raoult's law

B. van't Hoff Boyle's law

C. van't Hoff Charles' law

D. Henry's law

Answer: D

Watch Video Solution

353. Identify the compound amongst the following of which 0.1 M aqueous solution has highest boiling point.

A. Glucose

B. Sodium chloride

C. Calcium chloride

D. Ferric chloride

Answer: D

Watch Video Solution

354. The molarity of solution containing $15.20g$ of urea, (molar mass = 60) dissolved in $150g$ of water is

A. $1.689molkg^{-1}$

B. $0.1689molkg^{-1}$

C. $0.5922molkg^{-1}$

D. $0.2533molkg^{-1}$

Answer: A

Watch Video Solution

355. Solubility of which among the following substances in water increases slightly with rise in temperature ?

A. KNO_3

B. $NaNO_3$

C. KBr

D. NaBr

Answer: D

Watch Video Solution

356. The osmotic pressure of solution containing $34.2g$ of cane sugar (molar mass = 342 g mol^{-1}) in 1 L of solution at $20^{\circ}C$ is (Given $R = 0.082$ L atm $K^{-1}mol^{-1}$)

A. 2.40 atm

B. 3.6 atm

C. 24 atm

D. 0.0024 atm

Answer: A

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357. For which among the following equimolar aqueous solutions Van't Hoff factor has the lowest value ?

A. Aluminium chloride

B. Potassium sulphate

C. Ammonium chloride

D. Urea

Answer: D

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Test Your Grasp

1. Ideal solution is formed when its components

A. have zero heat of mixing only

B. have zero volume change on mixing only

C. have zero heat of mixing and zero volume

D. can be converted into gases

Answer: C

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2. Pressure cooker reduces cooking time because :

A. the heat is more evenly distributed inside the cooker

B. a large flame is used

C. boiling point of water is elevated

D. whole matter is converted into steam

Answer: C

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3. Which of the following 0.1 M aqueous solutions will exert highest osmotic pressure ?

A. NaCl

B. $BaCl_2$

C. $MgSO_4$

D. $Al_2(SO_4)_3$

Answer: D

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4. In which mode of expression, the concentration of a solution remains independent of temperature?

A. Normality

B. Molality

C. Molarity

D. Formality

Answer: B

Watch Video Solution

5. If 18 g of glucose is present in 1000 g of solvent, the solution is said to be

A. 1 Molar

B. 0.1 Molar

C. 0.5 Molal

D. 0.1 Molal

Answer: D

Watch Video Solution

6. Partial pressure of solvent in solution of non-volatile solute is given by equation.

A. $p = x_2 p^\circ$

B. $p^\circ = xp$

C. $p = x_1 p^\circ$

D. $p^\circ = x_1 p$

Answer: C

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7. Relative lowering of vapour pressure

A. is a property of solute

B. is a property of solute as well as solvent

C. is a property of solvent

D. is a colligative property

Answer: D

Watch Video Solution

8. A solution of $CaCl_2$ is 0.5 mol/litre , then the moles of chloride ion in 500 mL will be :

A. 0.5

B. 0.25

C. 1.0

D. 0.75

Answer: A

Watch Video Solution

9. How much volume of 3.0 M H_2SO_4 is required for the preparation of 1.0 litre of 1.0 M solution ?

A. 300 mL

B. 320 mL

C. 333.3 mL

D. 350.0 mL

Answer: C

Watch Video Solution

10. Which of the following is a colligative property ?

A. Surface tension

B. Osmotic pressure

C. Optical rotation

D. Viscosity

Answer: B

Watch Video Solution

11. Molal elevation constant is elevation in boiling point produced by

A. 1 g of solute in 100 g of solvent

B. 100 g of solute in 1000 g of solvent

C. 1 mole of solute in one litre of solvent

D. 1 mole of solute in one kg of solvent

Answer: D

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12. The vapour pressure of a solution having solid as solute and liquid as solvent is:

A. directly proportional to mole fraction of the solvent

B. inversely proportional to mole fraction of the solvent

C. directly proportional to mole fraction of the solvent

D. inversely proportional to mole fraction of the solute.

Answer: A

Watch Video Solution

13. The determination of molar mass from elevation in boiling point is called as.....

A. Cryoscopy

B. Osmometry

C. Ebullioscopy

D. Spectroscopy

Answer: C

Watch Video Solution

14. The semipermeable membrane used in Berkely -Hartley method is

A. animal bladder membrane

B. copper phosphate

C. copper ferricyanide

D. Copper ferrocyanide

Answer: D

View Text Solution

15. 1 mole heptane $(V.P = 92mmofHg)$ is mixed with 4 mol. Octane $(V.P = 31$ mm of $Hg)$, form an ideal solution. Find out the vapour pressure of solution.

A. 47.2mm of Hg

B. 40.0 mm of Hg

C. 43.2mm of Hg

D. 38.4 mm of Hg

Answer: B

Watch Video Solution

16. The vapour pressure of water at room temperature is 30 mm of Hg. If the mole fraction of the water is 0.9, the vapour pressure of the solution will be :

A. 30mm of Hg

B. 24 mm of Hg

C. 21 mm of Hg

D. 27 mm of Hg

Answer: D

Watch Video Solution

17. The values of gas constant and solution constant

A. are different

B. almost identical

C. gas constant is greater than solution constant

D. gas constant is smaller than solution constant

Answer: B

View Text Solution

18. When a non volatile solute is dissolved in a solvent, the relative lowering in vapour pressure is equal to

A. mole fraction of solvent

B. mole fraction of solute

C. concentration of solute in gL^{-1}

D. concentration of solute in g per100 mL

Answer: B

Watch Video Solution

19. Isotonic solutions have :

A. density

B. Molar concentration

C. Normality

D. strength

Answer: B

Watch Video Solution

20. If 23 g of glucose (molecular mass 180)is dissolved in 60ml of water at $15^{\circ}C$, then the osmotic pressure of this solution will be

A. 0.34 atm

B. 0.75 atm

C. 50.35 atm

D. 5.57 atm.

Answer: C

Watch Video Solution

21. Abnormal molar mass is produced by

A. association of solute

B. dissociation of solute

C. both association and dissociation of solute

D. separation by semi permeable membrane

Answer: C

View Text Solution

22. According to Van't Hoff -Avogadro's law volume occupied by solution is

A. directly proportional to mass of solute

B. inversely proportional to mass of solute

C. directly proportional to number of molecules of solute of

D. inversely proportional to number of molecules of solute

Answer: C

View Text Solution

23. If $0.1M$ solution of glucose and $0.1M$ solution of urea are placed on two sides of the semipermeable membrane to equal heights, then it will be be correct to say that

A. there will be no net movement across the membrane

B. glucose will flow towards urea solution

C. urea will flow towards glucose solution

D. water will flow from urea solution towards glucose solution

Answer: A

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24. The order of osmotic prssure of equimolar solutions of $BaCl_2$, $NaCl$ and glucose will be:

A. Glucose $>$ NaCl $>$ $BaCl_2$

B. $BaCl_2 > NaCl >$ glucose

C. $NaCl > BaCl_2 >$ glucose

D. $NaCl >$ glucose $> BaCl_2$

Answer: B

Watch Video Solution

25. The plant cell shrink when placed in a

A. water

B. a hypotonic solution

C. a hypertonic solution

D. an isotonic solution

Answer: C

Watch Video Solution

26. The molal elevation constant is the ratio of the elevation in boiling point to :

A. molarity

B. molality

C. mole fraction of solute

D. mole fraction of solvent

Answer: B

Watch Video Solution

27. 20g of NaOH (Molar mass $= 40gmol^{-1}$) is dissolved in 500 cm^3 of water.Molality of resulting solution is

A. 0.1m

B. 0.5m

C. 1.5m

D. 1.0m

Answer: D

Watch Video Solution

28. Molarity of solution depends on

A. temperature

B. nature of solute dissolved

C. weight of solvent

D. pressure

Answer: A

Watch Video Solution

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

A. reducing visocity

B. reducing specific heat

C. reducing freezing point

D. reducing boiling point

Answer: C

Watch Video Solution

30. Which of the following solutions will have lowest elevation in boiling point ?

A. $0.1mKCl$

B. 0.05m NaCl

C. $1mAlPO_4$

D. $0.1mMgSO_4$

Answer: B

Watch Video Solution

31. Molecular mass of non-volatile solute can be determined by :

A. Cryoscopic method

B. Victor-Meyer's method

C. Graham's method

D. Duma's method

Answer: A

Watch Video Solution

32. The freezing point order of the solution of glucose is :

A. $10\% > 3\% > 2\% > 1\%$

B. $1\% > 2\% > 3\% > 10\%$

C. $1\% > 3\% > 10\% > 2\%$

D. $10\% > 1\% > 3\% > 2\%$

Answer: B

Watch Video Solution

33. The molal freezing point for water is $1.86^\circ Cmol^{-1}$. If 342g of cane sugar is dissolved in 1000 mL of water, the solution will freeze at

A. $1.86^\circ C$

B. $-1.86^\circ C$

C. $-3.92^\circ C$

D. $3.92^\circ C$

Answer: B

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34. The elevation in boiling point of a solution of 10g of a binary electrolyte (molecular mass 100) in 100g of water is ΔT_b. The value of K_b for water is :

A. $\frac{\Delta T_b}{2}$

B. 10

C. $10\Delta T_b$

D. $\frac{\Delta T_b}{10}$

Answer: A

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35. Assuming the salts to be unionised in solution, which of the following has highest osmotic pressure ?

A. $1\ \%\ CsCl$

B. 1% RbCl

C. 1% KCl

D. 1% NaCl

Answer: D

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36. Which of the following will have maximum depression in freezing point ?

A. $0.5MLi_2SO_4$

B. 1M KCl

C. $0.5MAl_2(SO_4)_3$

D. $0.5MBaCl_2$

Answer: C

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37. Relative vapour pressure lowering for non electrolytic solute depends only on

A. Mole fraction of solute

B. Nature of solvent

C. Nature of solute

D. Nature of solute and solvent

Answer: A

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38. Van't Hoff factor is _____.

A. Less than one in case of dissociation

B. more than one in case of association

C. always less than one

D. less than one in case of association

Answer: D

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39. The movement of solvent molecules from higher concentration to lower concentration through semipermeable membrane under pressure is termed :

A. osmosis

B. reverse osmosis

C. dialysis

D. diffusion

Answer: B

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

A. ionisation of benzoic acid

B. dimerization of benzoic acid

C. trimerization of benzoic acid

D. solvent of benzoic acid

Answer: B

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41. K_b is given by _____.

A. $\frac{M_2 \Delta T_b \times W_2}{1000 \times W_1}$

B. $\frac{W_2}{\Delta T_b \times W_1 \times M_2} \times 1000$

C. $\frac{M_2 \Delta T_b \times W_1}{1000 \times W_2}$

D. $\frac{W_1}{\Delta T_b \times W_2 \times M_2} \times 1000$

Answer: C

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42. The vapour pressure of a solvent decreased by 10 mm of Hg when a non-volatile solute was added to the solvent. The mole fraction of solute in solution is 0.2, what would be the mole fraction of solvent if the decrease in vapour pressure is 20 mm of Hg?

A. 0.8

B. 0.6

C. 0.4

D. 0.2

Answer: B

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43. Which of the following is dimensionless quantity ?

A. Mole fraction

B. Molality

C. Molarity

D. Normality

Answer: A

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44. Which of the following property indicates weak intermolecular forces of attraction in liquid ?

A. High heat of vaporization

B. High vapour pressure

C. High critical temperature

D. High boiling point

Answer: B

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45. The molal b.pt constant for water is $0.513^{\circ} C \mathrm{kg\,mol}^{-1}$. When 0.1 mole of sugar is dissolved in 200g of water, the solution boils under a pressure of 1 atm at :

A. $100.513^{\circ} C$

B. $100.0513^{\circ} C$

C. $100.256^{\circ} C$

D. $101.025^{\circ} C$

Answer: C

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