



STRUCTURED MULTIMEDIA ENTRANCE PROGRAMME

Module - C	SOLUTIONS	Class Test
1. When an ideal binary solution is in equilibrium with its vapour, molar ratio of the two components in the solution and in the vapour phase is: (A) same (B) different (C) may or may not be same depending upon volatile nature of the two components (D) none of the above	7. The deviation from Raoult's law is greatest in (A) sugar solution (B) water oil mixture (C) salt solution (D) water-alcohol solution.	
2. Which of the following is not a binary solution? (A) Pure water + Sugar (B) Air (C) Mixture of benzene and toluene (D) Mixture of ethanol and methanol	8. Change in surface area has following effect on vapour pressure: (A) increases (B) decreases (C) does not affect vapour pressure (D) none of the above	
3. Mole fraction of the component A in vapour phase is x_1 and the mole fraction of component A in liquid mixture is x_2 , then (p_A^0 = vapour pressure of pure A; (p_B^0 = vapour pressure of pure B), the total vapour pressure of liquid mixture is: (A) $p_A^0 \frac{x_2}{x_1}$ (B) $p_A^0 \frac{x_1}{x_2}$ (C) $p_B^0 \frac{x_1}{x_2}$ (D) $p_B^0 \frac{x_2}{x_1}$	9. Which of the following will form an ideal solution? (A) C_2H_5OH and water (B) HNO_3 and water (C) $CHCl_3$ and CH_3COCH_3 (D) C_6H_6 and $C_6H_5CH_3$	
4. According to Henry's law, the solubility of a gas in a given volume of liquid increases with increase in: (A) Temperature (B) Pressure (C) Both (A) and (B) (D) None of these	10. Which of the following statements is correct, if the intermolecular forces in liquids A, B and C are in the order $B < C < A$? (A) B evaporates more readily than A (B) B evaporates less readily than C (C) A and B evaporate at the same rate (D) A evaporates more readily than C	
5. If partial pressure of Gas A = 0.4 bar, Gas B = 0.2 bar and Gas C = 0.5 bar, then the gas having maximum solubility (neglecting other factors) is: (A) A (B) B (C) C (D) All are equal soluble	11. A 5.2 molal aqueous solution of methyl alcohol, CH_3OH , is supplied. What is the mole fraction of methyl alcohol in the solution? (A) 1.00 (B) 0.190 (C) 0.086 (D) 0.050	
6. 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	12. Water is added to the solution such that the mole fraction of water in the solution becomes 0.9. The boiling point of the solution is (A) 354.7 K (B) 375.5 K (C) 376.2 K (D) 380.4 K	
	13. The vapour pressure of a pure liquid solvent (X) is decreased to 0.60 atm from 0.80 atm on addition of a non-volatile substance (Y). The mole fraction of (Y) in the solution is	

- (A) 0.20
- (B) 0.25
- (C) 0.50
- (D) 0.75

14. The freezing point of a 0.05 molal solution of a non-electrolyte in water is: (K_f of water =

- 1.86°C kg mol⁻¹)
- (A) -1.86°C
- (B) -0.93°C
- (C) -0.093°C
- (D) 0.93°C

15. 1.00 g of a non-electrolyte solute dissolved in 50 g of benzene lowered the freezing point of benzene by 0.40 K. K_f for benzene is

- 5.12 K kg mol⁻¹. Molecular mass of the solute will be
- (A) 256 g mol⁻¹
- (B) 2.56 g mol⁻¹
- (C) 512 × 10³ g mol⁻¹
- (D) 2.56 × 10⁴ g mol⁻¹

16. Henry's law constant for the molality of methane in benzene at 298 K is 4.27 × 10⁵ mm Hg. Calculate the solubility of methane in benzene at 298 K under 760 mm Hg.

- (A) 1.78 × 10⁻⁴
- (B) 1.78 × 10⁻³
- (C) 1.78 × 10⁴
- (D) 1.78 × 10⁻⁶

17. Match the solutions in Column-I with their nature in Column-II:

	Column I		Column II
(A)	Benzene + toluene	(p)	Non ideal solution
(B)	Ethanol + water	(q)	Ideal solution
(C)	Benzene + chloroform	(r)	$\Delta H_{\text{mixing}} > 0$
(D)	Carbon tetrachloride chloroform	(s)	$\Delta H_{\text{mixing}} = 0$

- (A) a-q, s; b-p, s; c-q; d-s
- (B) a-q, s; b-p, r; c-p; d-p, r
- (C) a-q, r; b-p, q; c-p; d-s
- (D) a-q, s; b-p, s; c-p, d-p, s

18. The question given below consist of two statements each printed as 'Assertion' (A) and 'Reason' (R). While answering the question you are required to choose any one of the following four options:

Assertion (A): An ideal solution obeys Raoult's law.

Reason (R): In an ideal solution, solute-solute as well as solvent-solvent interactions are

similar to solute-solvent interaction.

- (A) If both (A) and (R) are correct and (R) is the correct explanation for (A).
- (B) If both (A) and (R) are correct but (R) is not the correct explanation for (A).
- (C) If (A) is correct but (R) is incorrect.
- (D) If (A) is incorrect but (R) is correct.

19. The question given below consist of two statements each printed as 'Assertion' (A) and 'Reason' (R). While answering the question you are required to choose any one of the following four options:

Assertion (A): The sum of mole fractions of all the components of solution is unity.

Reason (R): Mole fraction is a temperature dependent quantity.

- (A) If both (A) and (R) are correct and (R) is the correct explanation for (A).
- (B) If both (A) and (R) are correct but (R) is not the correct explanation for (A).
- (C) If (A) is correct but (R) is incorrect.
- (D) If (A) is incorrect but (R) is correct.

20. 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 relative lowering in 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

solutions

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| 1. (C) | 2. (B) | 3. (A) | 4. (B) | 5. (C) |
| 6. (C) | 7. (D) | 8. (C) | 9. (D) | 10. (D) |
| 11. (C) | 12. (C) | 13. (B) | 14. (C) | 15. (A) |
| 16. (B) | 17. (B) | 18. (A) | 19. (C) | 20. (D) |