JEE

Prayas JEE 2026

Chemistry

Solutions

DPP: 1

Q1 Which of the following is the expression of Raoult's law?
(p = vapour pressure of pure solvent, p_s = vapour pressure of the solution)
(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) $\frac{p_s-p}{p} = \frac{N-n}{N}$

Q2 For a dilute solution, Raoults 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

Q3 The vapour pressure of pure benzene and toluene are 160 and 60 torr respectively. The mole fraction of toluene in vapour phase in contact with equimolar solution of benzene and toluene is
(A) 0.50 (B) 0.6
(C) 0.27 (D) 0.73

Q4 The vapour pressure of pure $CHCl_3$ and CH_2Cl_2 are 200 and $41.5\ atm$ respectively. The weight of $CHCl_3$ and CH_2Cl_2 are $11.9\ g$ and $17\ g$ respectively in a solution. The vapour pressure of solution (in atm) will
(A) 80.5 (B) 79.5
(C) 94.3 (D) 105.5

Q5 The vapour pressure of water at room temperature is lowered by 5% by dissolving a solute in it, then the approximately molality of solution is
(A) 2 (B) 1
(C) 4 (D) 3

Q6 For a binary ideal liquid solution, the total pressure of the solution is given as
(A) $P_{total} = P_A^\circ + (P_A^\circ - P_B^\circ)\, X_B$
(B) $P_{total} = P_B^\circ + (P_A^\circ - P_B^\circ)\, X_A$
(C) $P_{total} = P_B^\circ + (P_B^\circ - P_A^\circ)\, X_A$
(D) $P_{total} = P_B^\circ + (P_B^\circ - P_A^\circ)\, X_B$

Q7 At a given temperature, total vapour pressure (in Torr) of a mixture of volatile components A and B is given by

$$P = 240 + 120X_B$$

Hence, vapour pressure of pure A and B respectively (in Torr) are -
(A) 120,75 (B) 120,195
(C) 240,360 (D) 75,45

Q8 Two liquids A and B form ideal solutions. At 300 K, the vapour pressure of a solution containing 1 mole of A and 3 moles of B is $550\ mmHg$ At the same temperature, if one more mole of B is added to this solution, the vapour pressure of the solution increases by $10\ mmHg$ The vapour pressure of A and B in their pure states (in $mmHg$) are respectively
(A) 400,600 (B) 500,500
(C) 600,400 (D) None of these

Q9 Relative lowering of vapour pressure of a dilute solution is 0.2 . What is the mole fraction of the non-volatile solute?
(A) 0.8 (B) 0.5
(C) 0.3 (D) 0.2

Q10 The relative lowering of vapour pressure of a dilute aqueous solution containing non-volatile solute is 0.0125 . The molality of the solution is about

(A) 0.70 (B) 0.50
(C) 0.90 (D) 0.80

Answer Key

Q1	(A)	Q6	(B)
Q2	(B)	Q7	(C)
Q3	(C)	Q8	(A)
Q4	(C)	Q9	(D)
Q5	(D)	Q10	(A)

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