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Physical_Chemistry_2nd_YUGS_EV_ST

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Name of a student A. Hussain Signature [Signature] No. 43

Mustansiriyah University
Department of Chemistry

2nd SEM-2026_Bologna_Process
Mid Exam Class A Paper A

01/MCO test (Answer the following)

(Marks 50 %)

1: Depression of freezing point of a solution associated an increasing in?

Answer: a) T b) H c) μ d) S

2: When applying the reduced phase rule to condensed systems, the pressure is assumed to be ----- atm?

Answer: a) zero b) 1 c) 2 d) 3

3: The reduced phase rule applies when which variable is kept constant?

Answer: a) T b) conc c) p d) χ

4: Which One of the following expressions represents a negative deviation from Raoult's law?

Answer: a) $P_A^* \neq \chi_A P_A^*$ b) $P_A = \chi_A P_A^*$ c) $P_A > \chi_A P_A^*$ d) $P_A < \chi_A P_A^*$

5: Addition of a non-volatile solute to a pure solvent results in a change in?

Answer: a) $\Delta_{mix}H$ b) $\Delta_{mix}S$ c) $\Delta_{mix}V$ d) all of these

6: The difference between pure and impure solvent is?

Answer: a) $\mu^* = \mu$ b) $\mu^* > \mu$ c) $\mu^* < \mu$ d) $\mu^* \neq \mu$

7: The relationship between ΔT_f and χ_B is?

Answer: a) direct b) inverse c) disordered d) none of these

8: With the two-component system (A & B), one part of the solid phase consists of?

Answer: a) A + B b) A + solution c) B + solution d) A + eutectic

9: If you add a solute to a pure solvent, then there is a decrease in the ----- of the solution.

Answer: a) S b) H c) T d) μ

10: Dalton's law is used to calculate the partial pressure of which phase?

Answer: a) liquid b) gas c) solid d) plasma

02 A solution contains 4.0 g of an unknown substance in 0.5 dm³ of solution. Its osmotic pressure is 103 torr at 34.0 °C. Calculate the molar mass of the unknown substance. (Marks 25%)

03 Using the diagram below and the appropriate phase rule, fill in all the blanks and determine the composition of the all-eutectic mixture, all equilibria, all reversible and irreversible processes, and the name of the regions located to the right and left of points C, E & AB? (Marks 25%)



Name of a student _____ Signature _____ No. _____

$W = 4.0 \text{ g}$ $V = 0.5 \text{ dm}^3$ $T = 34.0^\circ\text{C} + 273 = 307 \text{ K}$
 $P = 103 \text{ Torr}$ $= 307 \text{ K}$
 $\Pi = [B] R T$
 $[B] = \frac{\Pi}{R T} = \frac{0.082}{0.0014 \frac{\text{L atm}}{\text{mol K}} \times 307 \text{ K}}$
 $[B] = \frac{103}{21200.636} = 0.00485 \text{ mol/L}$
 $M = \frac{W}{B} = \frac{4.0}{0.00485} = 824.74 \text{ mol/L}$
 $M = 1.94 \text{ mol/L}$

Handwritten notes: $Q_2 \frac{15}{25}$

Two component system ($f = C - P + 1$)

