



Name of a student _____ Signature _____ No. _____

Mustansiriya University
Department of Chemistry

2nd SEM-2025 Bologna Process
Mid_Exam_Class_B_Paper_A

Q1/ MCQ test (Answer the following)

(Marks 50 %)

1: The reduced phase rule is interested in two variants?

Answer: a) ~~p & T~~ b) F & T c) p & conc. d) T & conc.

2: Ideal solution follows ----- law.

Answer: a) Raoult's b) Trouton's c) Henry's law d) Van't Hoff's law

3: The three phases of H₂O in the phase diagram meets?

Answer: a) at 1 atm b) over 1 atm c) below 1atm d) at any pressure

4: Liquid solution of HNO₃ is formed from?

Answer: a) 1 C b) 2 C c) 3 C d) 4 C

5: How many phases are there when the number of variants is zero and the number of components is one?

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

6: The Clausius-Clapeyron equation can be applied when there is an equilibrium between one of the following?

Answer: a) L & L b) S & L c) G & L d) S & S

7: One of the following formulas represents the right equation of Henry's law?

Answer: a) $P_A = \chi_A P_A^*$ b) $P_A > \chi_A P_A^*$ c) $P_A < \chi_A P_A^*$ d) none of these

8: Molality is used to calculate the molar mass of the?

Answer: a) non-volatile solute b) pure solute c) pure solvent d) solution

9: Osmosis pressure exerts when the solvent transfers to the?

Answer: a) volatile solute b) non-volatile solute c) pure solvent d) solution

10- One of the most important benefits of measuring ΔV_P , ΔT_b , ΔT_f and $\Delta \Pi$ is to calculate ----- of B?

Answer: a) M b) m c) V d) p

Q2/ The vapor pressure (VP) of a substance is 30 torr at 250 K. At what temperature will the substance have VP of 150 torr? $\Delta_{vap}H$ is 45 kJ mol⁻¹ (Marks 25%)

Q3/ Plot the phase diagram of the system (A & B) assumed that (A & B) do not react with each other. A freezes at (-5 °C) and B freezes at (7 °C), and that an eutectic mixture is formed when the ratio is 70 wt % of A and that the eutectic melts at (-10°C), then label all the parts (p & F) of the diagram? (Marks 25%)

Q2/

Answer

$$\ln \frac{P_f}{P_i} = \frac{\Delta H_{vap}}{R} \left(\frac{1}{T_f} - \frac{1}{T_i} \right)$$

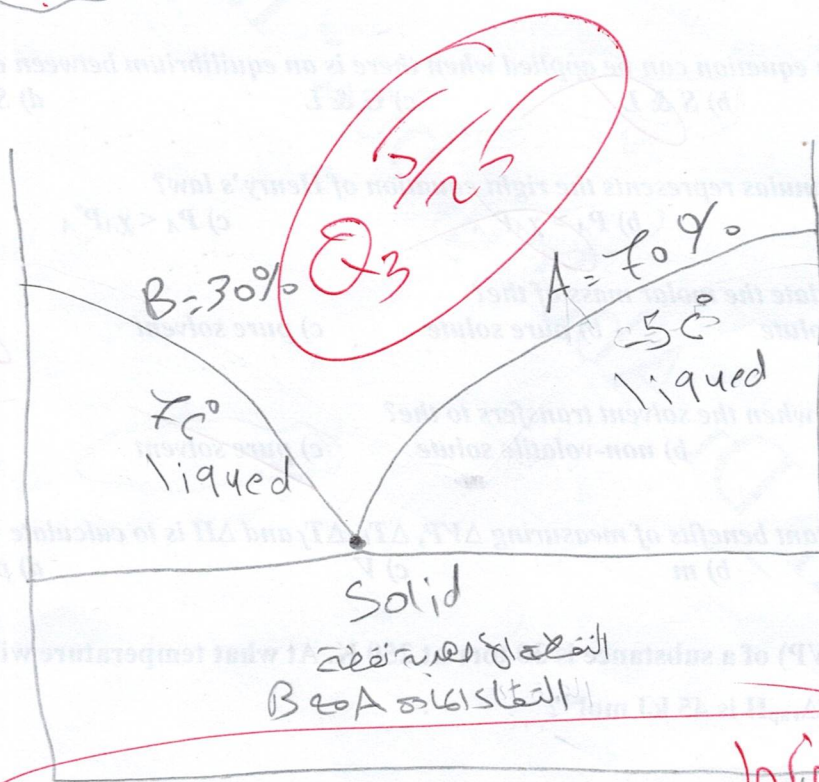
$$\ln \frac{150 \text{ torr}}{30 \text{ torr}} = \frac{45 \text{ kJ mol}^{-1}}{8.314 \text{ J}} \left(\frac{1}{250 \text{ K}} - \frac{1}{T_i} \right)$$

$$\ln 5 = 5.41 \text{ kJ mol}^{-1} (250 \text{ K})$$

~~1.61~~

$$T = \frac{5.41 \text{ kJ mol}^{-1} \times 250}{\dots} \Rightarrow T = 230 \text{ K}$$

Q223



عند نقطة A
B يتغير المكون
ويبدأ تغير في المكون

WtA = 70%
WtB = 30%

~~$F = C - P + 2$~~
 $F = 2 - 1 + 2 = 3$
 3 درجات الحرية
 3 درجات الحرية

~~$F = C - P + 1$~~
 $F = 2 - 1 + 1 = 2$
 2 درجات الحرية
 2 درجات الحرية