Physical_Chemistry_2nd_YUGS_EV_ST

Name of a student -- Signature ------------------------------------No. ----

Mustansiriyah 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?
<u>Answer:</u>　a) p & T　　　　b) F & T　　　　c) p & conc.　　　　d) T & conc.

2: Ideal solution follows - - - - - - - - - - law.
<u>Answer:</u>　a) Raoult's　　　b) Trouton's　　　c) Henry's law　　　d) Van't Hoff's law

3: The three phases of H_2O in the phase diagram meets?
<u>Answer:</u>　a) at 1 atm　　　b) over 1 atm　　　c) below 1atm　　　d) at any pressure

4: Liquid solution of HNO_3 is formed from?
<u>Answer:</u>　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?
<u>Answer:</u>　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?
<u>Answer:</u>　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?
<u>Answer:</u>　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?
<u>Answer:</u>　a) non-volatile solute　　　b) pure solute　　　c) pure solvent　　　d) solution

9: Osmosis pressure exerts when the solvent transfers to the?
<u>Answer:</u>　a) volatile solute　　　b) non-volatile solute　　　c) pure solvent　　　d) solution

10- One of the most important benefits of measuring ΔVP, ΔT_b, ΔT_f and $\Delta\Pi$ is to calculate - - - - - of B?
<u>Answer:</u>　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%)

Thur_13-03-2025　　　　　　　　Best wishes　　　　　　　　Dr Abduljabbar I. R. Rushdi

Q/2/

$$\Delta T_b = T_b \times b$$

$$= 250 \times 30$$

$$\Delta T_{b_1} = 7500$$

$$\Delta T_b = T_b \times b$$

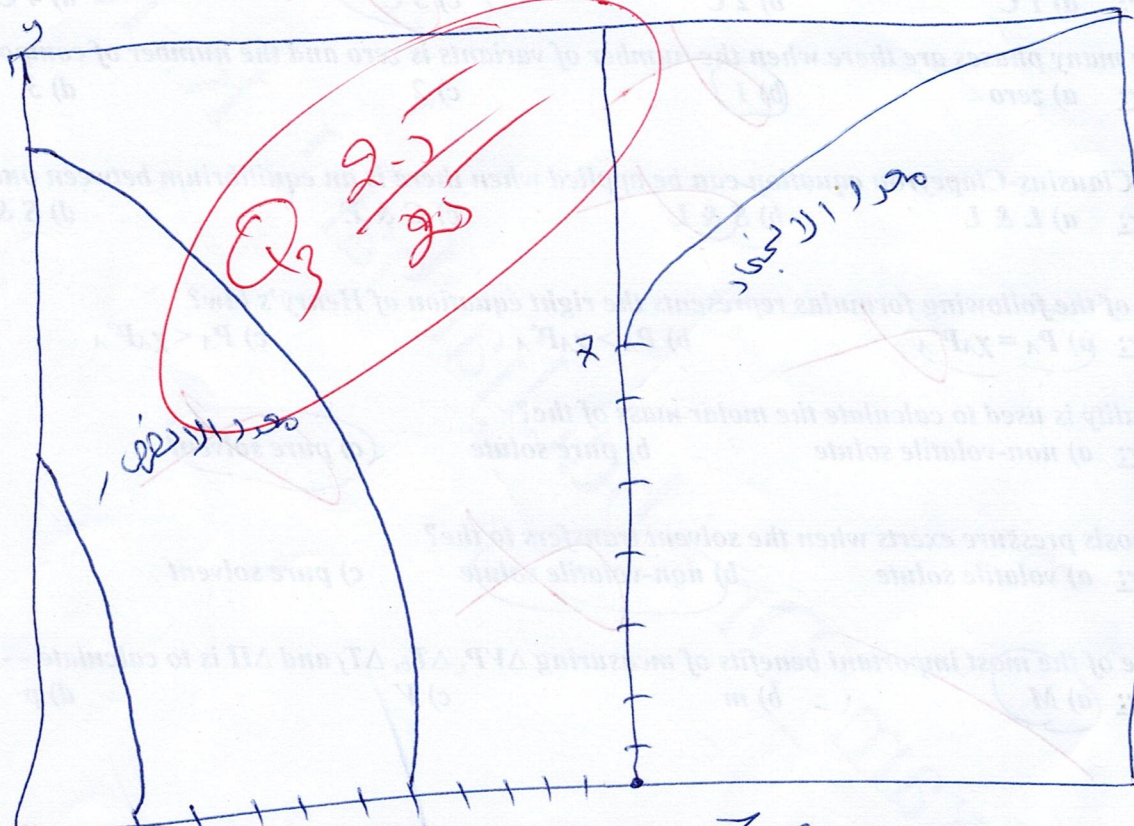$$\Delta T_b = 25 \times 150$$

$$\Delta T_{b_2} = 37500$$

$$T_b = \frac{\Delta T_b}{\Delta T_{b_2}} \implies \Delta T_b = \frac{7500}{37500}$$

$$\implies \Delta T_b = 0.2$$

Q/3/