Mid Quize

Physical_Chemistry_2nd_YUGS_EV_ST

Name of a student ------------------------------------- Signature ------------------------------- No. --16--

Mustansiriyah University   2nd_SEM-2025_Bologna_Process
Department of Chemistry   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%)

$$\ln \frac{P_2}{P_1} = - \frac{\Delta_{vap}H}{R}\left(\frac{1}{T_2} - \frac{1}{T_1}\right)$$

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
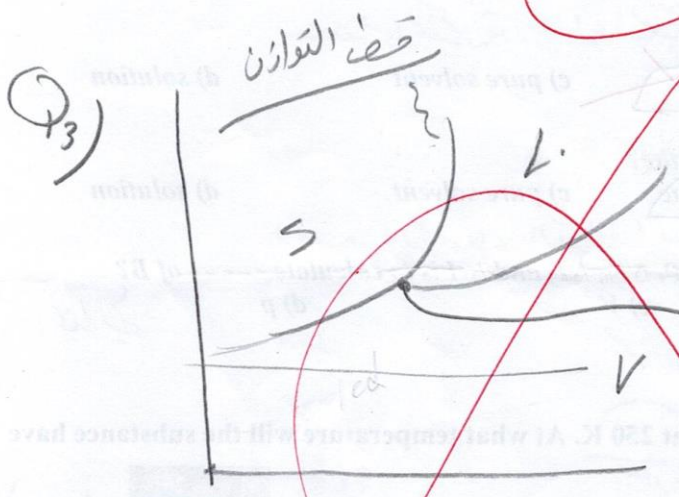% of A and that the eutectic melts at (− 10°C), then label all the parts (p & F) of the diagram? (Marks 25%)

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

Q₂) $\ln\left(\dfrac{P_2}{P_1}\right) = \dfrac{-\Delta V_{ap}H}{R}\left(\dfrac{1}{T_2} - \dfrac{1}{T_1}\right)$

(8.314 J K⁻¹ mol⁻¹)

$\ln\left(\dfrac{150}{30}\right) = \dfrac{-45000 \ J \ mol^{-1}}{8.314 \ J \ K^{-1} \ mol^{-1}}\left(\dfrac{1}{T_1} - \dfrac{1}{250K}\right)$

كبلو KJ J كبلو
45 × 1000
45000
J mol⁻¹

$\Rightarrow \quad 5 = -374.1\left(\dfrac{1}{T_1} - \dfrac{1}{250K}\right)$

Q₂ Zero

$T = C - P + 2$

$1 - 2 + 2$

$= 1$

Q₃) خط التوازن

S

L

V

خط الكيس

خط الكيس

WT(A) = 70%

WT(B) = 30%

$\Rightarrow 0.7 = \dfrac{70}{\quad} \times 100\%$

عدد حبابات النظام = 1
بحيث لو فقط لوجود النظام
الاكثر

× 7C كبلو
× 5 ماد
× 70 ماد