



Physical\_Chemistry\_2<sup>nd</sup>\_YUGS\_EV\_ST

Name of a student Sajad Bahaa

Signature [Signature]

Mustansiriyah University  
Department of Chemistry

2<sup>nd</sup> 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 H<sub>2</sub>O in the phase diagram meets?

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

4: Liquid solution of HNO<sub>3</sub> 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  $\Delta V_P$ ,  $\Delta T_b$ ,  $\Delta T_f$  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<sup>-1</sup>? (Marks 25%)

Q2 Zero / 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%)

Q3 Zero / 25

Q/21

$$\frac{P_f}{P_i} = \frac{\Delta_{\text{vap}}H}{R} \cdot T_2 - T_1$$

$$\frac{150}{30} = \frac{45}{8.314} \cdot T_2 - 290K$$

$$5_{\text{torr}} = 5.41 \cdot T_2 - 290K$$

$$\frac{5}{100}$$