



# Mid Quiz

## Physical Chemistry 2<sup>nd</sup> YUGS EV ST

10  
100

Ten only



Name of a student \_\_\_\_\_

Signature \_\_\_\_\_

No. 15

Mustansiriyah University  
Department of Chemistry

2<sup>nd</sup> SEM 2025 Bologna Process  
Mid Exam Class B Paper A

(Marks 50 %)

### Q1/ MCQ test (Answer the following)

Q 5  
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

$$F = C - P + 2$$

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?  $\Delta_{\text{vap}}H$  is 45 kJ mol<sup>-1</sup>

(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/

$$\ln \frac{P_2}{P_1} = -\frac{\Delta V_{apH}}{R} \left( \frac{1}{T_2} - \frac{1}{T_1} \right)$$

$$\frac{150 \text{ torr}}{30 \text{ torr}} = -\frac{45 \text{ kJ/mol}}{8.314} \left( \frac{1}{T_2} - \frac{1}{250 \text{ K}} \right)$$

$$P_2 = 30 \text{ torr}$$

$$P_1 = 150 \text{ torr}$$

$$T_1 = 250 \text{ K}$$

$$\Delta V_{ap} = 45 \text{ kJ/mol}$$

~~8.314~~

$$S_s = -5.41 \left( \frac{1}{T_2} - \frac{1}{250} \right)$$

$$S_s = \frac{-5.41}{T_2} + \frac{5.41}{250}$$

$$S_s = \frac{-5.41}{T_2} + 0.0216$$

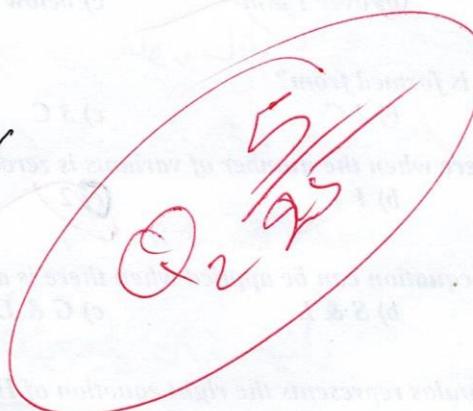
$$S - 0.0216 = \frac{-5.41}{T_2}$$

$$4.97, \frac{-5.41}{T_2}$$

$$+ T_2 4.97 = -5.41$$

$$T_2 = \frac{5.41}{4.97}$$

$$T_2 = 1.08 \text{ K}$$



Q3/

