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

Mustansiriyah University
Department of Chemistry

2nd SEM-2025_Bologna_Process
Mid_Exam_Class_A_Paper_C

Q1/ MCQ test (Answer the following) (Marks 50 %)

1: Depression of freezing point of a solution means increasing in?
Answer: a) T b) H c) μ d) S

2: If you apply the reduced phase rule to condensed systems, then the expected value of pressure is ------?
Answer: a) zero b) 1 c) 2 d) 3

3: The reduced phase rule can be applied when the number of components is -------?
Answer: a) zero b) 1 c) 2 d) 3

4: Which One of the following formulas represents the right equation of negative deviation from Raoult's law?
Answer: a) $P^*_A \neq \chi_A P_A$ b) $P_A = \chi_A P^*_A$ c) $P_A > \chi_A P^*_A$ d) $P_A < \chi_A P^*_A$

5: Addition of a non-volatile solute to the pure solvent causes a change in?
Answer: a) $\Delta_{mix}H$ b) $\Delta_{mix}S$ c) $\Delta_{mix}V$ d) all of these

6: The difference between pure and impure solvent is?
Answer: a) $\mu^* = \mu$ b) $\mu^* > \mu$ c) $\mu^* < \mu$ d) $\mu^* \neq \mu$

7: The relationship between ΔT_f and χ_B is?
Answer: a) direct b) inverse c) disordered d) none of these

8: With the two-component system (A & B), one part of the solid phase consists of?
Answer: a) A + B b) A +solution c) B + solution d) A + eutectic

9: If you add a solute to a solvent, then there is a decrease in the ----- of the solution.
Answer: a) S b) H c) T d) μ

10: Dalton's law is used to calculate the partial pressure of ---------- phase?
Answer: a) liquid b) gas c) solid d) plasma

Q2/ The Π of a solution containing 4.0 g of an unknown substance per 0.5 dm^3 of solution is 10^3 torr at 34.0 °C. Find the molar mass of this unknown. (Marks 25%)

Q3/ Using the diagram below and the appropriate phase rule, fill in all the blanks and determine the composition of the all-eutectic mixture, all equilibria, all reversible and irreversible processes, and the name of the regions located to the right and left of points C, E & AB? (Marks 25%)

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$\Pi = 10^3$ Torr $T = 34.0^\circ C + 273 = 307\ K$ $w = 4\ g$ $mwt = ?$

$$\Pi V = \frac{w}{mwt} RT \qquad \Pi = \frac{w}{V} RT$$

$$1000 \times 0.5 = \frac{4\ g * 307\ K}{0.082\ L.atm.mol^{-1} * mwt}$$

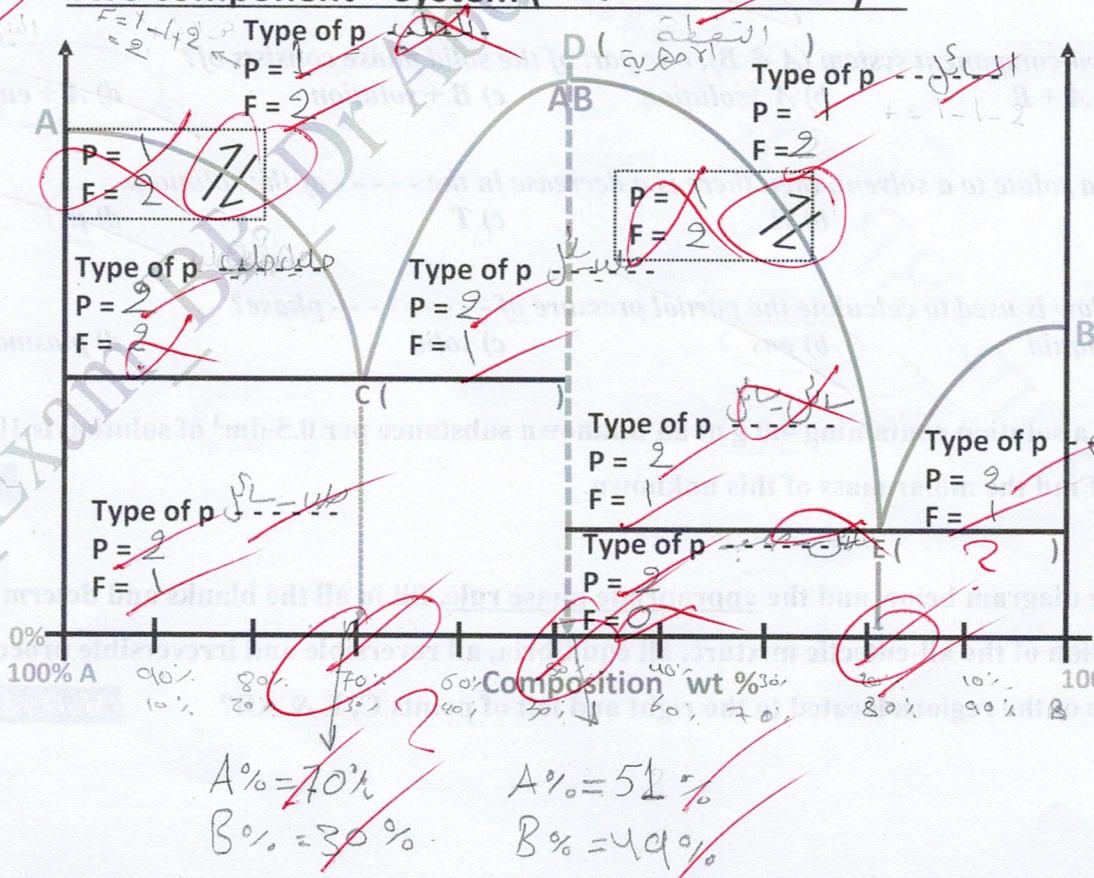
$$mwt = \frac{11228\ g}{0.082\ mol^{-1} * 500}$$

$$= 29.95\ g/mol^{-1}$$

Q2 5/25

Q3 10/25

Two component system (سائل - صلب)



F = C + P - 2

F = 2 + 2 - 2

F = 2

A% = 70%

B% = 30%

A% = 51 %

B% = 49%