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 ● μ d) S

**2: If you apply the reduced phase rule to condensed systems, then the expected value of pressure is - - - - - -?**
Answer: ● 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 ● 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) $P_A > \chi_A P^*_A$ ● $P_A < \chi_A P^*_A$

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

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

**7: The relationship between $\Delta T_f$ and $\chi_B$ is?**
Answer: ● 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 ● B + solution ~~● 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 ● μ

**10: Dalton's law is used to calculate the partial pressure of - - - - - - - - - phase?**
Answer: a) liquid ● 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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Q2 10/25

$T = 340^\circ C + 273K = 313K$ → 307K

$\pi = RT[B]$

$atm = 0.082 \frac{L \cdot atm}{K \cdot mol} (313K)[B]$

$760,000 atm$

$760 atm$

$10^3 torr = 760 atm$ Wrong 6

$\frac{10^3}{760 atm}$

$760 \times 1000 = 760000 atm.$

$atm = 0.082 \frac{L \cdot atm}{K \cdot mol} (313K)[B]$ → 307K

$760,000 = 25$

$atm = 25.7[B]$

$[B] = \frac{29.5}{5} \frac{L}{mol}$

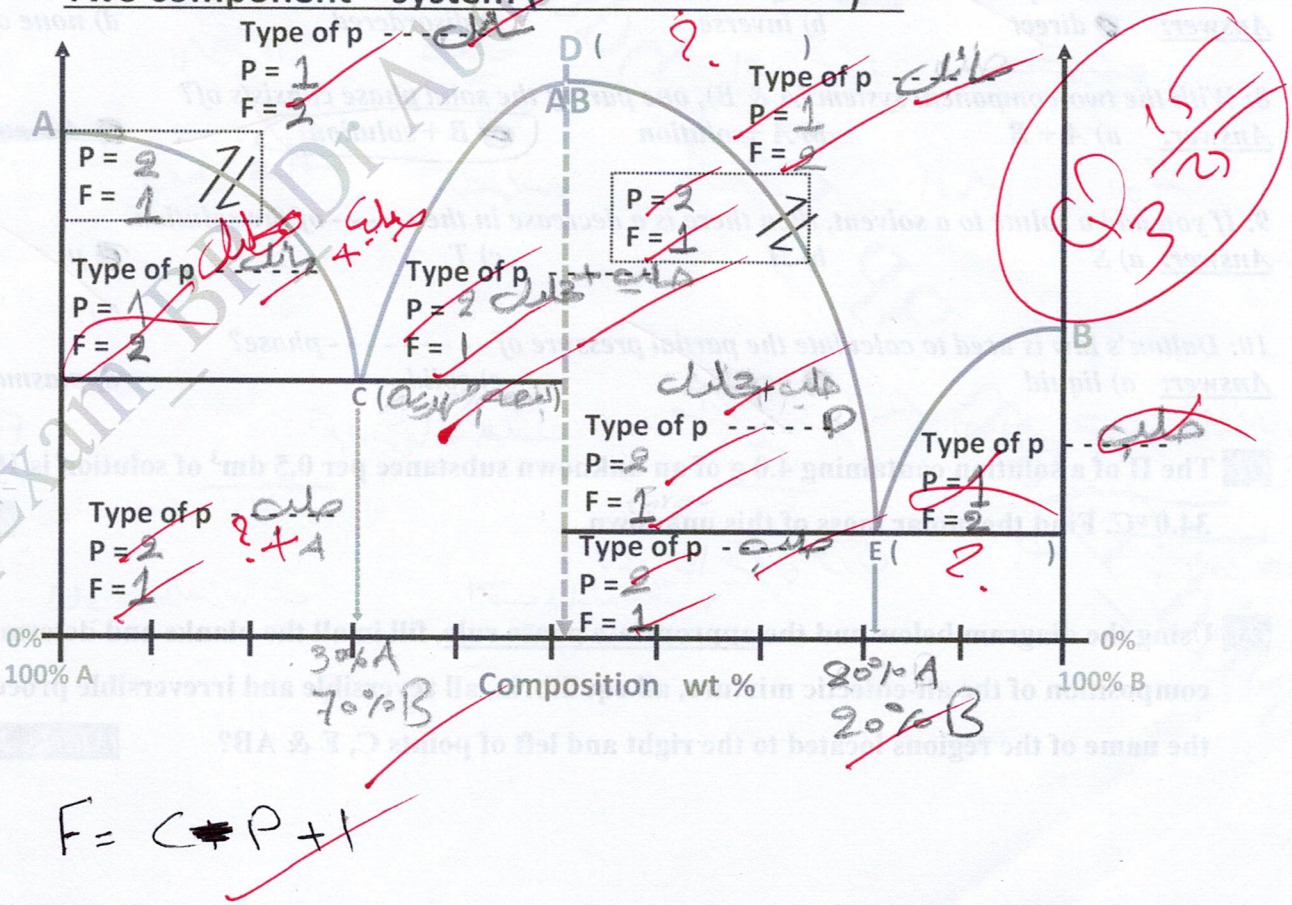
$[B] = \frac{n}{V} = \frac{\text{molar mass}}{V \times M}$ ✓

$= 5 \times 0.05$

$= 14.75 mol$

$M.wt = 4359 g/mol$

## Two component system ( 2 )




Q3 15/20

$F = C - P + 1$