



2-25

F35

Physical Chemistry 2<sup>nd</sup> YUGS\_EV\_ST

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Name of a student \_\_\_\_\_ Signature \_\_\_\_\_ No. \_\_\_\_\_

Mustansiriyah University  
Department of Chemistry

2<sup>nd</sup> SEM 2026 Bologna Process  
Mid Exam Class A Paper A

01/MCO test (Answer the following)

(Marks 50 %)

30/50

1: Depression of freezing point of a solution associated an increasing in?

Answer: a) T b) H c)  $\mu$  d) S

2: When applying the reduced phase rule to condensed systems, the pressure is assumed to be ----- atm?

Answer: a) zero b) 1 c) 2 d) 3

3: The reduced phase rule applies when which variable is kept constant?

Answer: a) T b) conc c) p d)  $\chi$

4: Which One of the following expressions represents a 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 a pure solvent results in 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  $\Delta T_f$  and  $\chi_B$  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 pure solvent, then there is a decrease in the ----- of the solution.

Answer: a) S b) H c) T d)  $\mu$

10: Dalton's law is used to calculate the partial pressure of which phase?

Answer: a) liquid b) gas c) solid d) plasma

02 A solution contains 4.0 g of an unknown substance in 0.5 dm<sup>3</sup> of solution. Its osmotic pressure is 103 torr at 34.0 °C. Calculate the molar mass of the unknown substance. (Marks 25%)

$P = \dots$   
 $M = ?$

03 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%)



Name of a student

Signature

No.

$T^* = 34.0 + 273 = 307 K$

$P_{atm} = \frac{10^3}{760} = 0.1355 \text{ atm}$

$V_{mL} = 0.5 \div 10^{-6} = 5 \times 10^{-5} \text{ m}^3$

$\pi = [A] R T$

$0.18 = [A] (0.082) (307)$

$0.18 = 25.174 [A]$

$[A] = \frac{0.18}{25.174} = 7.1502$

$[A] = \frac{n_{AB}}{V_{AB}}$

$7.1502 = \frac{n_{AB}}{5 \times 10^{-5}}$

$w_{tA} = 4.0 g$

$V_A = 0.5 \text{ dm}^3$

$P = 10^3 \text{ torr}$

$T = 34.0 \text{ C}$

$M = ?$

$R = 0.082$

$n_A = 7.1502 \times 5 \times 10^{-5}$

$n_A = 3.5751 \times 10^{-5}$

$M = \frac{w_t}{n_A}$

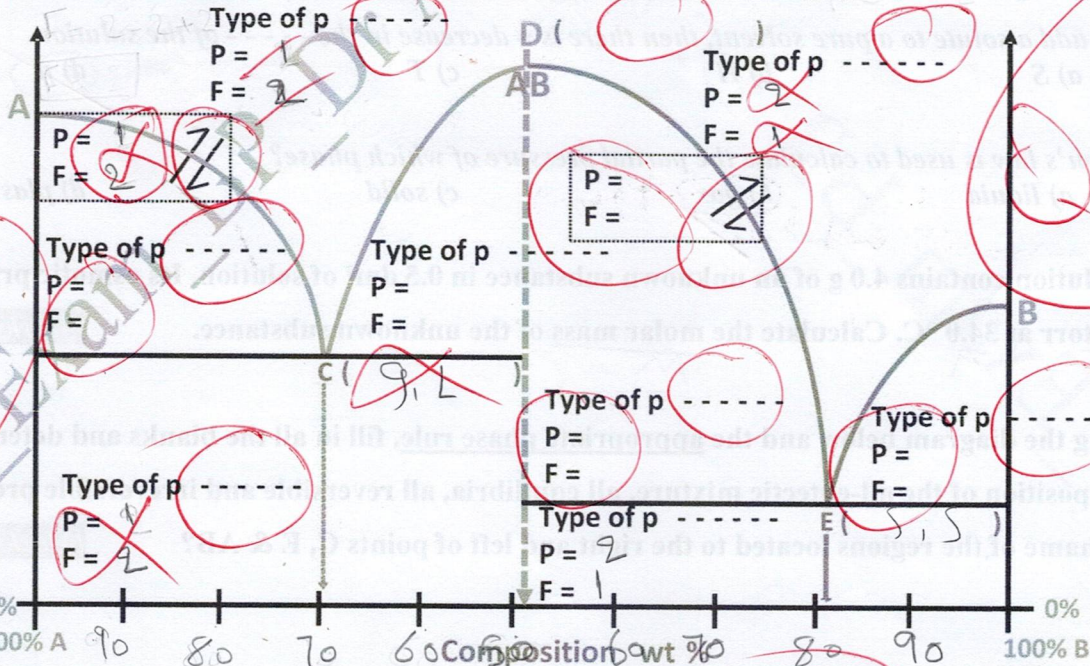
$M = \frac{4.0}{3.5751 \times 10^{-5}}$

$M = 1.1188 \times 10^5$

Q2  $\frac{10}{25}$

$F = C - P + 1$   
 $C = 2$

Two component system



5/25

درجہ الحرارة  
منا التركيب  
وین درجہ الحرارة