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F-30

40/100



Physical\_Chemistry\_2<sup>nd</sup>\_YUGS\_EV\_ST-2026

Name of a student

رسول حافظ هلا ب

Signature

2<sup>nd</sup> SEM-2026 Bologna\_Process

Mustansiriyah University  
Department of Chemistry

Mid\_Exam\_Class\_A\_Paper\_A

No. A8

01/ MCO test (Answer the following)

(Marks 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%)

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. \_\_\_\_\_

$PV = nRT$   
 $PV = \frac{m}{M} RT$

$m = \frac{PVRT}{w}$   
 $m = \frac{1.03 \text{ atm} \times 0.5 \text{ m}^3 \times 0.082 \text{ L} \cdot \text{atm} \cdot \text{mol}^{-1} \cdot \text{K}^{-1} \times 307 \text{ K}}{49}$

$M = 324.19 \text{ g} \cdot \text{m}^{-3}$

$\frac{PV}{RT}$   
 wrong eq 6

$w = 49$   
 $V = 0.5 \text{ dm}^3$   
 $V = 0.5 \times 10^{-3} \text{ m}^3$   
 $P = 1.03 \text{ bar} = 1 \text{ par} = 1 \text{ bar}$   
 $T = 34^\circ \text{C} = 307 \text{ K}$   
 $m = ?$

Q2

Equation?

Q3

Two component system (Condens)

