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F18

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

30/102 Thirt  
A20  
2026  
Abduljabbar  
Q. 20/50



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

Q1/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

Q2 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%)

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%)



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

wt = 4.0 g    V = 0.5     $\pi = 103 \text{ torr}$     T = 34.0 °C    molar mass = ?

Molar mass =  $\frac{wt}{[B]}$

\* K ← °C

Molar mass =  $\frac{4.0}{3.257}$

T = 34.0°C + 273K

T = 307K

Molar mass = 1.228

$\pi = RT [B]$

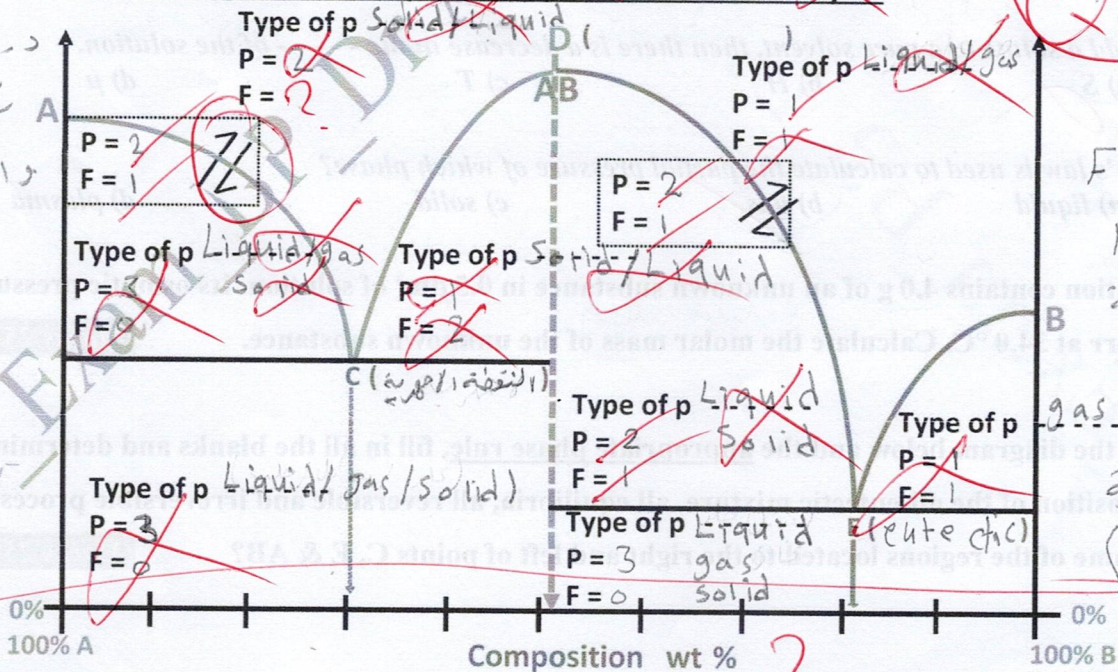
103 torr = 0.082 \* 307K [B]

[B] =  $\frac{103 \text{ torr}}{0.082 * 307K}$

[B] = 3.257

Handwritten notes and corrections in red ink, including 'Q2', '5/25', and 'atm د, د, د'.

Two component system (F = C - P + 1)



Handwritten notes on the left side of the phase diagram.

Handwritten notes on the right side of the phase diagram.