



50/100
50/100
50/100

Name of a student ملائكة عبد العزيز Signature [Signature] No. B4
Mustansiriyah University
Department of Chemistry

2nd SEM-2026_Bologna_Process
Mid_Exam_Class_A_Paper_B

Q1/ MCQ test (Answer the following)

Marks 50 %

1: Which two variables does the Gibbs phase rule consider as independent??

- Answer: a) p & T b) F & T c) p & conc. d) T & conc.

2: If NaCl is added to ice, which property of the solution increases?

- Answer: a) LP b) VP c) FP d) BP

3: At what pressure do the three phases of CO₂ coexist in the phase diagram?

- Answer: a) at 1 atm b) over 1 atm c) below 1 atm d) at any pressure

4: Which phase corresponds to a supercooled substance?

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

5: How many phases are present when a one-component system has two degrees of freedom?

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

6: The Clausius equation can be applied to which of the following phase equilibria?

- Answer: a) melt. & freez. b) frees. & melt. c) vap. & cond. d) all of these

7: What is the relationship between the VP of a solution and the solute molality?

- Answer: a) direct b) inverse c) disordered d) none of these

8: Which type of solute, when added to a solvent, alters its colligative properties?

- Answer: a) non-volatile solute b) volatile solute c) pure solute d) pure solvent

9: In osmosis, the solvent moves toward which component?

- Answer: a) solute b) impure solute c) mixture d) pure solvent

10: One of the most important applications of measuring molar mass of the solute is to study the change in ---.

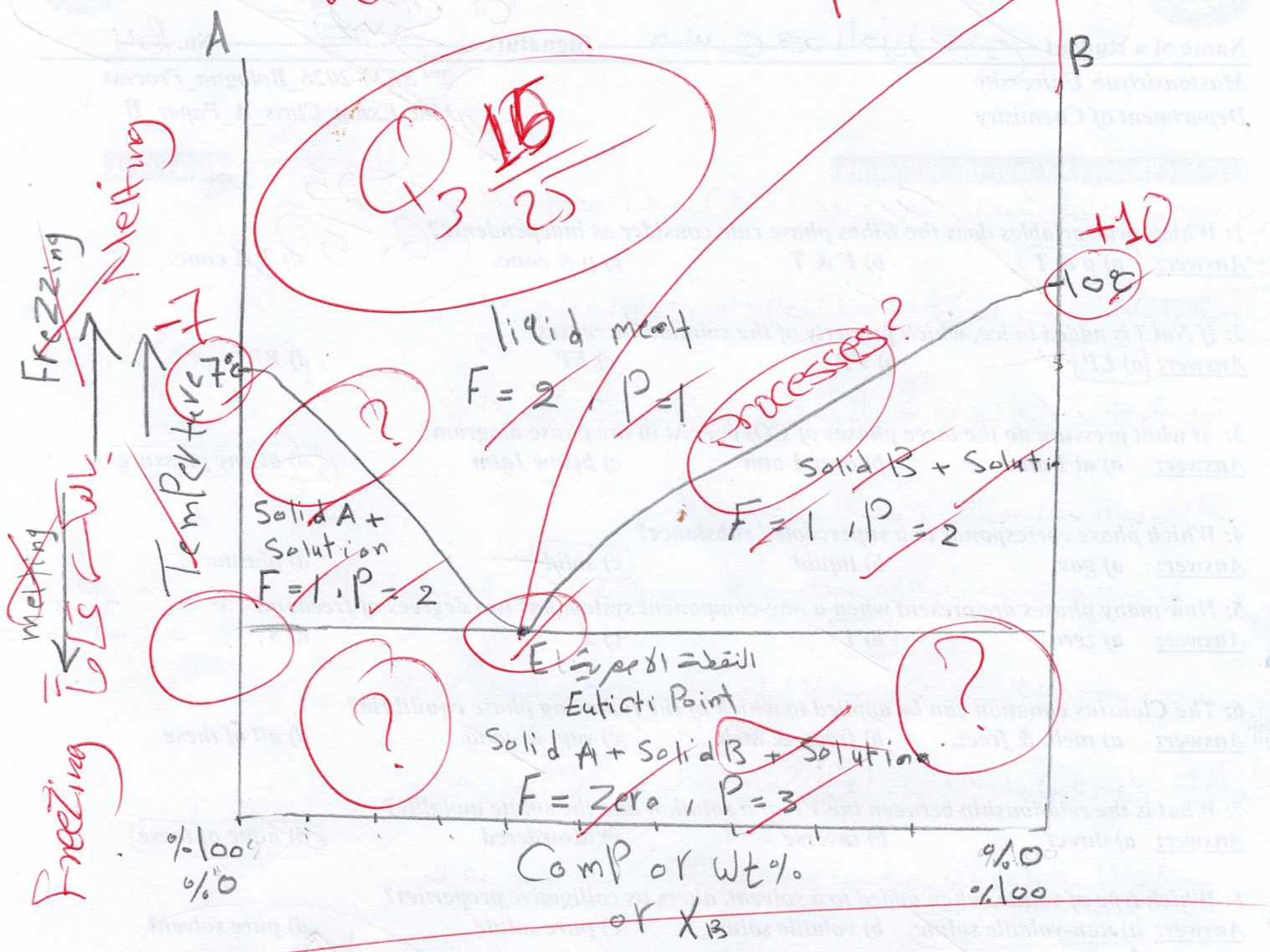
- Answer: a) m b) Π c) ν d) p

Q2/ 0.5 mol of a non-P-solute was added to 12.0 mol of P-solvent, VP* is 12.0 kPa at 295 K. What is the VP at 295 K? Determine the deviation of this solution from Raoult's law where VP_{ideal} = 10 kPa. (Marks 25%)

$$P_A = X_A P_A^* \Rightarrow \frac{12}{12.52} = \frac{0.5}{12.52} \Rightarrow \frac{12}{12.52} = 0.96 \Rightarrow \frac{0.5}{12.52} = 0.04$$

Q3/ Plot the phase diagram of the system (α and β) assumed that (α and β) do not react with each other. α freezes at (-7 °C) and β freezes at (10 °C), and that a eutectic mixture is formed when the ratio is 30 wt % of β and that the eutectic melts at (-10 °C), then label all the parts (p & F) of the diagram using the appropriate phase rule? (Marks 25%)

Where is the eq! B +10°C



لقد نتوجب مساحة باقية كل
السؤال الثاني بدلاً من اكل فوق
السؤال نفسه (هنا) وما مضى من
يا ليعينه تصحيح الطريقة من
الاعداد وجود مساحة باقية لا
الملاحظات اول MP و