F2

Physical_Chemistry_2nd_YUGS_EV_ST

Name of a student ---------- Signature ---------- No. ----

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 decreases?
Answer: a) LP b) VP c) FP d) BP

3: At what pressure do the three phases of CO_2 coexist in the phase diagram?
Answer: a) at 1 atm b) over 1 atm c) below 1atm 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) V 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%)

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%)

Sun_05-04-2026 Best wishes Dr Abduljabbar I. R. Rushdi

Q2/

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Q2. NO ANSWER, Why?

Q_2 zero / 25

صلب غير تقي = 0.5 mol

المذيب يتقي = 12.0 mol

VP^* الضغط البخاري النقي = 12.0 kPa = 295 k

VP الضغط البخاري لمحلول = 295 k

Q3/ 10/25

المعادلة $F = C - P + 1$

$T = 7°C$

Liquid soliton

$P = ?$

A soliton

$P = ?$ $f_A = 2$

$f = 3$

B soliton

$f_B = 2$

Solid Solid soliton

$f_A = 1$ $P = ?$

$f_B = 1$ $P = ?$

Name?

Name?

B $+10°C$

A 12 11 10 9 8 7 6 5 4 3 2 1 0

$\%A$ 100 90 80 70 60 50 40 30 20 10 0 B

$\%B$ 0 10 20 30 40 50 60 70 80 90 100