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Mustansiriyah University
Department of Chemistry

2nd_SEM-2025_Bologna_Process
Mid_Exam_Class_B_Paper_B

Q1/ MCQ test (Answer the following)   (Marks 50 %)

1: If the relation between the amount of solute and the Π is proportional, then the right equation is?
Answer: a) $\Pi \alpha VP$ b) $\Pi \alpha BP$ c) $\Pi \alpha V$ d) $\Pi \alpha [B]$

2: If the deposition is dominated, then one of the following will be true.
Answer: a) $\Delta_{vap}H = +ve$ b) $\Delta_{vap}H = -ve$ c) $\Delta_{sub}H = +ve$ d) $\Delta_{sub}H = -ve$

3: How many phases are there when the number of variants is one and the number of components is one?
Answer: a) zero   b) 1   c) 2   d) 3

$F = X_2 - X_1 + 2$

4: Which One of the following formulas represents the right equation of positive 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 the pure solvent causes a change in?
Answer: a) $\Delta_{mix}H$ b) $\Delta_{mix}S$ c) $\Delta_{mix}V$ d) all of these

6: How many p and F of CO_2 when it is positioned at the boundary of the phase?
Answer: a) $p = 2$ & $F = 1$ b) $p = 3$ & $F = 0$ c) $p = 1$ & $F = 2$ d) $p = 2$ & $F = 2$

7: Liquid water and ice are formed from?
Answer: a) 1 C   b) 2 C   c) 3 C   d) 4 C

8: With the two-component system (Pb & Ag), one part of the solid phase consists of?
Answer: a) pb + Ag   b) Pb + solution   c) Ag + solution   d) Pb + eutectic

9: If you add a non-polar solute to a non-polar solvent, then the expected type of mixture will be - - - - - law.
Answer: a) Van't Hoff's   b) Raoult's   c) − ve form Raoult's   d) + ve form Raoult's

10: If it is required to calculate the Y_A, then one of the following laws will be applicable?
Answer: a) Raoult   b) Henry   c) Dalton   d) Van't Hoff

Q2/ The VP of pure benzene is 75 mmHg at 20 °C, and VP of pure toluene is 25 mmHg at 20 °C. The mole fraction of each pure component is 0.5. What is the partial VP of each component after mixing?

(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%)

Thus_13-03-2025   *With my best wishes*   **Dr Abduljabbar I. R. Rushdi**

$$T = 20 + 273 = \boxed{293 \, K}$$

$P_A = x_A P_A^*$
Benz
$= 0.5 \, ? \times 0.098 \, ?$
$= \boxed{0.02 \, 45}$

$\dfrac{75}{760} = \boxed{6.098 \, atm}$? Evaluate

$\dfrac{25}{760} = \boxed{0.032 \, atm}$

$\dfrac{10}{25}$ $\dfrac{2}{25}$

$P_A = x_A P_a^*$
Tolu.
$= 0.5 \, ? \times 0.032 \, ?$
$= \boxed{0.0064} \, ?$

E?

NO need!

0.25

Two component system ( )

Type of p Liquid-
P = 2
F = 3

D ( )

AB

Type of p Liquid
P = 2
F = 3

Benzene
20% A

naphthalen
80%

P = 2
F = 2

P = 2
F = 2

Type of p -
P = 1
F = 1

Type of p -
P = 1
F = 1

B

C ( )

Type of p -
P = 2
F = 2

Type of p -
P = 2
F = 2

Type of p -
P = 2
F = 0

Type of p -
P = 2
F = 0

E ( )

0%
100% A

Composition wt %

0%
100% B