



Physical Chemistry 2nd YUGS EV ST



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

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Department of Chemistry

1st SEM-2025 Bologna Process
Mid Exam Class A Paper B

Q1: Circle the right answer for all of the following

(50 Marks)

1: Liquification of the gas means which of the following?

- (a) $pV_m = nRT$ (b) $pV_m < nRT$ (c) $pV_m > nRT$ (d) $pV_m \neq nRT$

2: What is the right formula that can be used for calculating the mole fraction of the gas in a mixture?

- (a) V/n (b) n/V (c) V/m (d) n_i/n_T

3: A real gas behaves like an ideal gas, when which of the following is true?

- (a) $pV_m/RT = 1$ (b) $pV_m/RT \neq 1$ (c) $pV_m/RT < 1$ (d) $pV_m/RT > 1$

4: Heat energy transfer can be measured by which of the following?

- (a) thermometer (b) closed system (c) heat capacity (d) calorimeter

5: An isobaric process means which of the following?

- (a) $\Delta T = 0$ (b) $\Delta p = 0$ (c) $C_v \Delta T = 0$ (d) $C_p \Delta T = 0$

6: The unit of C_p/C_v is:

- (a) $J \text{ mol}^{-1} \text{ K}^{-1}$ (b) $J \text{ g}^{-1} \text{ K}^{-1}$ (c) $J \text{ mol}^{-1} \text{ }^\circ\text{C}^{-1}$ (d) none of these

7: When the process cannot compensate the loss of q, then we can call it:

- (a) isothermal (b) adiabatic (c) isobaric (d) isochoric

8: When the system is completely isolated, then ΔH can be calculated by which of the following?

- (a) $p_{ex} \Delta V$ (b) $nRT \ln V_f/V_i$ (c) $C_p \Delta T$ (d) ΔVU

9: $C_p > C_v$ due to which of the following?

- (a) ΔU (b) Q (c) ΔH (d) R

10: When the process is reversible and $p_{in} > p_{ex}$, the process is called:

- (a) isochoric (b) isothermal (c) isobaric (d) exothermic

Q2: Calculate the density of an unknown gas with a molar mass of 40 g mol^{-1} at STP conditions. (25 points)

Q3: A diatomic ideal gas is compressed reversibly and adiabatically at T_i of 67°C to T_f of 450 K . Calculate

- (a) work was performed? (b) ΔU , (c) q and (d) ΔH .

(25 Marks)

Q211

الم آنبه يتحول ال C ال K

M = 40 g/mol R = 0.082 J.k/mol P = 1 atm

Where is the law?

V = 2.24

d = (2.24 x 0.082 x 25) / 40 = 4.592 / 40 = 0.1148 mol/L

Q2 = 10/25

Q3

ΔT = 450 - 340 = 110 K

w = -P ΔT

w = -2 x 110 = -220

Q3 = 5/25

ΔU = q + w

ΔU = 0 + 220 = 220 J/g

ΔH = ΔU = 220

monatomic

q = 0