



Physical Chemistry 2nd YUGS EVI ST



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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) $p_{\text{ex}} \Delta V$ (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 $p_{\text{in}} > p_{\text{ex}}$, 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)

Q2/

molar mass = 40 g mol⁻¹

NO ANSWER, why.

Q2/25

Q3/ $T_i = 67^\circ\text{C} \Rightarrow T_K = T_c + 273$
 $T_f = 450\text{K}$ $T_K = 67 + 273$
 $T_K = 340\text{K}$

$\Delta T = T_f - T_i$
 $\Delta T = 450\text{K} - 340\text{K}$
 $\Delta T = 110\text{K}$

Q3/25

~~$q = w$~~

~~$\Delta U = q + w = 0$~~

~~$\Delta U = \Delta H = 0$~~
isothermal