2.25/5 F30 45/100 Forty Five

Physical_Chemistry_2nd_YUGS_EV_ST 11-12-2025

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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)** Q1 25/50

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 $mol^{-1}K^{-1}$ (b) J $g^{-1}K^{-1}$ (c) J $mol^{-1}\,^oC^{-1}$ (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) $nRTLnV_f/V_i$ (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)**

W_{rev} =

Q2/ $PV = nRT \Longrightarrow PV = \frac{m}{M} RT$

$PM = dRT$

$d = \frac{PM}{RT}$

"STP" المعطيات :-

$T = 25^{\circ}C + 273\ K$

$T = 298\ K$

$P = 1\ atm$

$R = 0.082\ atm.L/mol.K$

$M = 40\ g\ mol^{-1}$

$d = \frac{1\ atm * 40\ g\ mol^{-1}}{0.082\ atm.L/mol.K * 298\ K}$

$d = \frac{40\ g}{24.436} \Longrightarrow d \simeq 1.636\ g/L$

Q2 2025

Q3/

D $W_{rev}_{ad} = -nRT \ln \frac{V_f}{V_i}$

$W_{rev}_{ad} = -nRT \ln$

Q3 zero 25

② $\Delta U = q + W$

$\Delta H = \Delta U + \Delta n_g \Delta T$