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

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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 $mol^{-1}K^{-1}$ (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 ^oC to T_f of 450 K. Calculate (a) work was performed? (b) ΔU, (c) q and (d) ΔH. **(25 Marks)**

Q2/

$d = ??$, $M = 40\ g\ mol^{-1}$, $P = 1\ atm$, $T = 25°C + 273 = 298\ K$ → 0°C → 273 K

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

$$d = \frac{1\ atm * 40\ g\ mol^{-1}}{0.0821\ L\ atm\ mol^{-1}\ K^{-1} * 298\ K}$$

$$d = \frac{40\ g\ L^{-1}}{24.436\ L}$$

$$d = 16.36\ g\ L^{-1}$$

Q2 20/25

Q3/ $T_i = 67°C + 273 = 340\ K$, $T_f = 450\ K$

$W = ?$, $\Delta U = ?$, $Q = ?$, $\Delta H = ??$

Q3 zero 25

NO ANSWER Why?