

Time \rightarrow 20 min

Thermodynamics.

4x4 = 16 Marks

Topic \rightarrow I

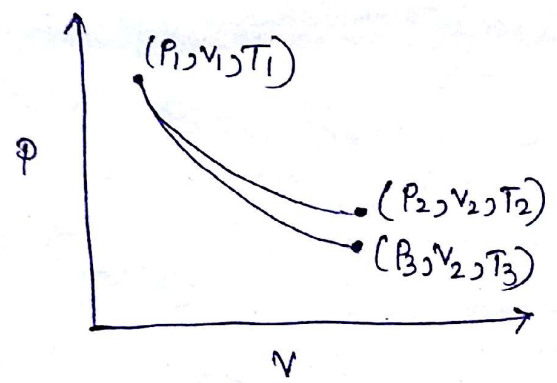
(1) one mole of a non-ideal gas undergoes a change of state (2.0 atm, 3.0 L, 95(K) \rightarrow (4.0 atm, 5.0 L, 245K) with a change in internal energy, $\Delta U = 30.0 \text{ Latm}$. The change in enthalpy (ΔH) of the process in Latm is

(a) 40.0 (b) 42.3 (c) 44.0 (d) not defined, because pressure is not constant.

(2) Two moles of an ideal gas is expanded isothermally and reversibly from 1 litre to 10 litre at 300K. The enthalpy change (in KJ) for the process is -

(a) 11.4 KJ (b) -11.4 KJ (c) 0 KJ (d) 4.8 KJ.

(3) The reversible expansion of an ideal gas under adiabatic and isothermal conditions is shown in the figure. Which of the following statement(s) is correct?



- (a) $T_1 = T_2$ (b) $T_3 > T_1$ (c) $W_{\text{isothermal}} > W_{\text{adiabatic}}$
- (d) $\Delta U_{\text{isothermal}} > \Delta U_{\text{adiabatic}}$.

(4) The ΔH_f° for $\text{CO}_2(\text{g})$, $\text{CO}(\text{g})$ and $\text{H}_2\text{O}(\text{g})$ are -393.5, -110.5 and -241.8 KJ mol $^{-1}$ respectively. The standard enthalpy change (in KJ) for the reaction $\text{CO}_2(\text{g}) + \text{H}_2(\text{g}) \rightarrow \text{CO}(\text{g}) + \text{H}_2\text{O}(\text{g})$ is.

- (a) 524.1 (b) 41.2 (c) -262.5 (d) -41.2