

HINTS & SOLUTION TO WORKBOOK - 2

Thermodynamics

Daily Tutorial Sheet-12	Level-3
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141.(D) $W_{\text{net}} = W_{AB} + W_{BC} + W_{CA}$

$$= -P\Delta V + 0 - P_1 V_1 \ln \frac{V_2}{V_1} = -3 \times 20 - 30 \times 1 \ln \frac{10}{30} = -25.45 \text{ lt - atm}$$

142.(A) $T_A = T_C = \frac{PV}{nR} = \frac{3 \times 10}{1 \times 0.08} = 375 \text{ K}$

143.(B) $\Delta U = \Delta H = 0$ for cyclic process

144.(B) For isothermal process, $P_2 = P_1 \cdot \frac{V_1}{V_2}$

For adiabatic process, $P_2 = P_1 \cdot \left(\frac{V_1}{V_2} \right)^\gamma$

Since $\frac{V_1}{V_2} < 1 \Rightarrow (P_2)_{\text{isothermal}} > (P_2)_{\text{adiabatic}}$

145.(B) For same final pressure ;

For isothermal process ; $V_2 = V_1 \left(\frac{P_1}{P_2} \right)$

For adiabatic process ; $V_2 = V_1 \left(\frac{P_1}{P_2} \right)^{1/\gamma}$

Since $\frac{P_1}{P_2} > 1 \Rightarrow (V_2)_{\text{iso}} > (V_2)_{\text{adia}}$

146.(C) $P_1 V_1^\gamma = P_2 V_2^\gamma$