Daily Tutorial Sheet 8	Level – 2 | JEE Advanced Pattern

96.(B) Since $-\frac{1}{2}\frac{d[N_2O_5]}{dt} = k\,[N_2O_5] \Rightarrow \frac{-d[N_2O_5]}{dt} = 2k[N_2O_5] = k'[N_2O_5]$

$\therefore \quad t_{1/2} = \frac{0.693}{k'} = \frac{0.693}{2\times k} = \frac{0.693}{2\times 3.38\times 10^{-2}}$; $t_{1/2} = \frac{0.693}{6.76\times 10^{-2}} \approx 10$ min

So after 10 min pressure will drop to half of its initial pressure.

97.(D) $\Delta H = (E_a)_f - (E_a)_b$

$-200 = 80 - (E_a)_b \Rightarrow (E_a)_b = 280$ kJ mol^{-1}

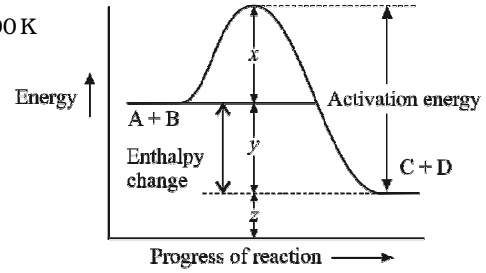
98.(B) $k_1 = k_2 \Rightarrow 10^{10}\, e^{-20000/T} = 10^{12}\, e^{-24606/T} \Rightarrow \exp\left(\frac{24606}{T} - \frac{20000}{T}\right) = 100$

$\frac{4606}{T} = \ell n\ 100 = 4.606 \Rightarrow T = \frac{4606}{4.606} = 1000\,K$

99.(C) For $C + D \longrightarrow A + B$

Enthalpy change = y

Activation energy = x + y



100.(B) $27^\circ C \xrightarrow[T]{} 10^{-3}\,min^{-1}$ (k)

$17^\circ C \longrightarrow \frac{10^{-3}}{2} = 5\times 10^{-4}\,min^{-1}$

101.(A) $+\frac{1}{2}\frac{d[NH_3]}{dt} = -\frac{1}{1}\frac{d[N_2]}{dt} = -\frac{1}{3}\frac{d[H_2]}{dt} + \frac{K_1}{2} = -K_2 = -\frac{K_3}{3}$

$1.5K_1 = 3K_2 = K_3$

102.(B) $\frac{E_a}{T_1} = \frac{E_a^c}{T_2} \Rightarrow \frac{T_2}{T_1} = \frac{E_a^c}{E_a} = \frac{75}{100} = 0.75, \quad \frac{300}{T_1} = 0.75$

$\Rightarrow \quad T_1 = \frac{300}{0.75} = 400\ K = 127^\circ C$

103.(C) I represents kinetic while II represents equilibrium region.

104.(B) $r_f = K_1[A][B] \Rightarrow r_b = K_2[C]$ Net rate $= k_1[A][B] - k_2[C]$

105.(CD) As per the Arrhenius equation $\ln k = \ln A - \frac{E_A}{RT}$