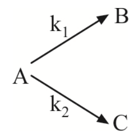
Date Planned : __ / __ / __	Daily Tutorial Sheet-14	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-3	Exact Duration :________

153. Consider the reaction.



The rate constant for two parallel reactions were found to be $10^{-2}\ dm^3\ mol^{-1}\ s^{-1}$ and $4 \times 10^{-2}\ dm^{-3}\ mol^{-1}\ s^{-1}$. If the corresponding energies of activation of the parallel reaction are 100 and 120 kJ/mol respectively, what is the net energy of activation (E_a) of A ?

(A) 100 kJ/mol **(B)** 120 kJ/mol **(C)** 116 kJ/mol **(D)** 220 kJ/mol

154. For the following reaction,

$$Fe(s) + 2H^+(aq) \longrightarrow Fe^{2+}(aq) + H_2(aq)$$

rate law is $\frac{dx}{dt} = k[Fe]\,[H^+]^2$

If pH is decreased by x units at constant [Fe] rate becomes 100 times. What is the value of x ?

Paragraph for Question No. 155 - 157

The gaseous reaction : $n_1A(g) \longrightarrow n_2B(g)$ is first order with respect to A. The true rate constant of reaction is k. The reaction is studied at a constant pressure and temperature. Initially, the moles of A were 'a' and no B were present

155. How many moles of A are present at time, t?

(A) $a \cdot e^{-kt}$ **(B)** $a \cdot e^{-n_1kt}$

(C) $a \cdot e^{-n_2kt}$ **(D)** $a(1 - e^{-n_1kt})$

156. If the initial volume of system were v_0, then the volume of system after time, t, will be

(A) $\frac{n_1v_0}{n_2}$ **(B)** $\frac{n_2v_0}{n_1}$

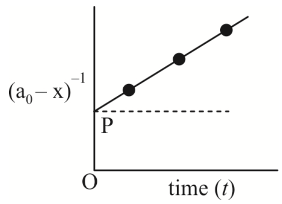
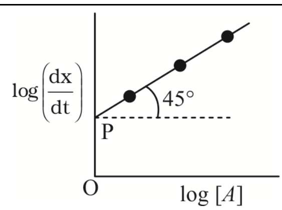
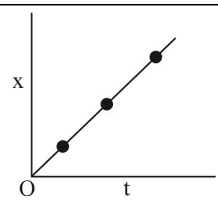
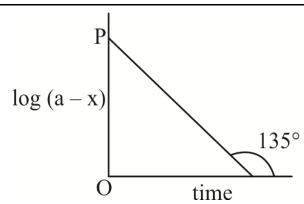
(C) $v_0\left[\frac{n_2}{n_1} - \left(1 - \frac{n_2}{n_1}\right) \cdot e^{-n_1kt}\right]$ **(D)** $v_0\left[\frac{n_2}{n_1} - \left(\frac{n_2}{n_1} - 1\right) \cdot e^{-n_1kt}\right]$

157. What will be the concentration of A at time t, if $n_1 = 1$ and $n_2 = 2$?

(A) $[A_0] \cdot e^{-kt}$ **(B)** $[A_0]\left(\frac{e^{-kt}}{2 - e^{-kt}}\right)$

(C) $[A_0]\left(\frac{e^{-kt}}{1 - e^{-kt}}\right)$ **(D)** $[A_0](1 - 2 \cdot e^{-kt})$

158. Match the graph in Column I with their, related properties in Column II.

	Column I		Column II
(A)		**(1)**	Rate constant is equal to rate of reaction
(B)		**(2)**	If OP = 0.5 $[A]_0 = 2$
(C)		**(3)**	If OP = 0.3010 Half-life = 0.693 at $[A]_0 = 2$ M
(D)		**(4)**	If OP = 0.3010 k = 2
		(5)	Half-life is independent of initial concentration
		(6)	Rate becomes 4 times on doubling [A]