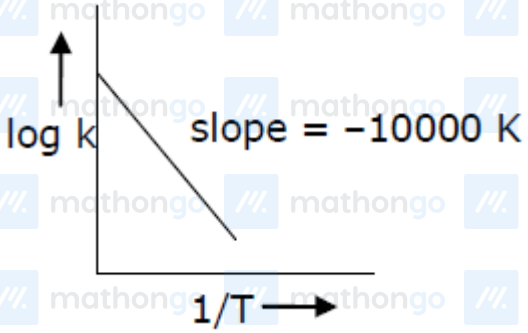
Q1: 24 Feb (Shift 2) - Numerical

Sucrose hydrolyses in acid solution into glucose and fructose following first order rate law with a half-life of 3.33 h at $25^{\circ}C$. After 9 h, the fraction of sucrose remaining is f. The value of $\log_{10}\left(\frac{1}{f}\right)$ is ____ $\times 10^{-2}$ (Rounded off to the nearest integer) [Assume: $\ln 10 = 2.303, \ln 2 = 0.693$]

Q2: 25 Feb (Shift 1) - Numerical

For the reaction, $aA + bB \rightarrow cC + dD$, the plot of $\log k$ vs $\frac{1}{T}$ is given below:



The temperature at which the rate constant of the reaction is 10^{-4} s^{-1} is ____ K. [Rounded off to the nearest integer) [Given: The rate constant of the reaction is 10^{-5} s^{-1} at 500 K]

Q3: 25 Feb (Shift 2) - Numerical

The rate constant of a reaction increases by five times on increase in temperature from $27^{\circ}C$ to $52^{\circ}C$. The value of activation energy in $kJmol^{-1}$ is ____. (Rounded off to the nearest integer)

$\left[R = 8.314 \text{ J } K^{-1} \text{ mol}^{-1}\right]$

Q4: 26 Feb (Shift 1) - Numerical

An exothermic reaction $X \rightarrow Y$ has an activation energy 30 kJ mol^{-1}. If energy change ΔE during the reaction is -20 kJ, then the activation energy for the reverse reaction in kJ is

Q5: 26 Feb (Shift 2) - Numerical

If the activation energy of a reaction is 80.9 kJ mol^{-1}, the fraction of molecules at 700 K, having enough energy to react to form products is e^{-x}. The value of x is ____

(Rounded off to the nearest integer)

[Use $R = 8.31 JK^{-1} mol^{-1}$]

Answer Key

Q1 (81) **Q2** (526) **Q3** (52) **Q4** (50)

Q5 (14)