

Q- For a given reaction, presence of catalyst reduces the energy of activation by 2 Kcal at  $27^{\circ}\text{C}$ . The rate of reaction will be increased by -

- (A) 20 times      (B) 14 times      (C) 28 times      (D) 10 times

Ans: (C) 28 times

And careful,  $T = 27^{\circ}\text{C} = 300\text{K}$  (Absolute temp)

$$\ln\left(\frac{k_2}{k_1}\right) = \frac{+(E_{a1} - E_{a2})}{RT} = \frac{-(E_{a2} - E_{a1})}{RT}$$

$$\Rightarrow \frac{k_2}{k_1} = \exp\left(\frac{+2000}{2 \times 300}\right) = \exp\left(\frac{+10}{3}\right)$$

$$\Rightarrow = 28.0316$$