Question 1. Activation energy of a chemical reaction can be determined by
(a) determining the rate constant at standard temperature
(b) determining the rate constants at two temperatures
(c) determining probability of collision
(d) using catalyst

Solution: (b) Activation energy of a chemical reaction is related to rate constant of a reaction at two different temperatures i.e., K_1 and K_2 respectively.

$$\log \frac{k_2}{k_1} = \frac{E_a}{2.303R} \left(\frac{1}{T_1} - \frac{1}{T_2} \right)$$

where, E_a = activation energy
T_2 = higher temperature
T_1 = lower temperature
k_1 = rate constant at temperature T_1
k_2 = rate constant at temperature T_2
This equation is known as Arrhenius equation.