Q) 7

$$A + B \longrightarrow AB$$

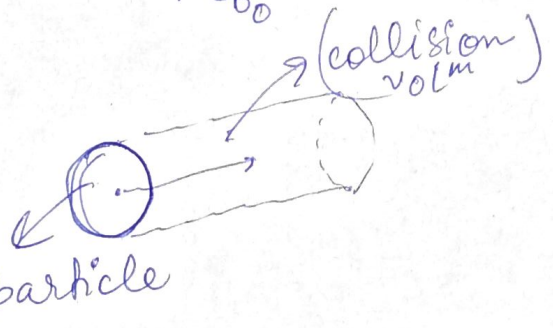
(gas phase elementary rxn)

$$r_A = (K C_A C_B)$$

A & B ⟶ spherical molecules

rxn time = $\frac{1}{K C_{A0}}$ if A is limiting

" = $\frac{1}{K C_{B_0}}$ if B is limiting



length scale = mean free path

Mean free path = distance travelled by particle b/w successive collisions

* ** ✗ free path of spherical particles is cylindrical in shape

∴ the dia of vessel should be equal or greater than mean free path.

Dimensionless time = time ratio = $\frac{\text{time}}{\text{timescale}}$

$$= \frac{t}{\left\{\frac{1}{K C_{A0}} \text{ or } \frac{1}{K C_{B0}}\right\}}$$