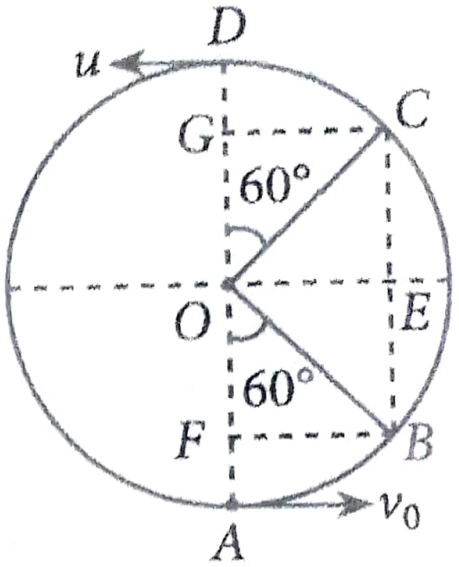
2. **(b)** : $OG = L\cos 60° = L/2 = CE$

$AF = L - L\cos 60° = L/2$

Let the speed at D be u.



$$\text{At } D: mg = \frac{mu^2}{L} \Rightarrow u^2 = gL$$

Using conservation of energy between A and D.

$$\frac{1}{2}mv_0^2 + 0 = \frac{mu^2}{2} + mg \times 2L$$

$$\Rightarrow v_0^2 = 5gL \qquad \text{...(i)}$$

Using conservation of energy between A and B

$$\frac{mv_0^2}{2} = \frac{mv_B^2}{2} + mg\,(L - L\cos 60°) \;;\; v_0^2 = v_B^2 + gL$$

$$v_B^2 = 5gL - gL \Rightarrow v_B^2 = 4gL \qquad \text{...(ii)}$$

Using conservation of energy between A and C

$$\frac{mv_0^2}{2} = \frac{mv_C^2}{2} + mg\left(L + \frac{L}{2}\right) \;;\; 5gL = v_C^2 + 3gL$$

$$v_C^2 = 2gL \qquad \text{...(iii)}$$

$$\frac{KE_B}{KE_C} = \frac{\frac{1}{2}m(4gL)}{\frac{1}{2}m(2gL)} = \frac{2}{1}$$

(Using eqn. (i) and (iii))