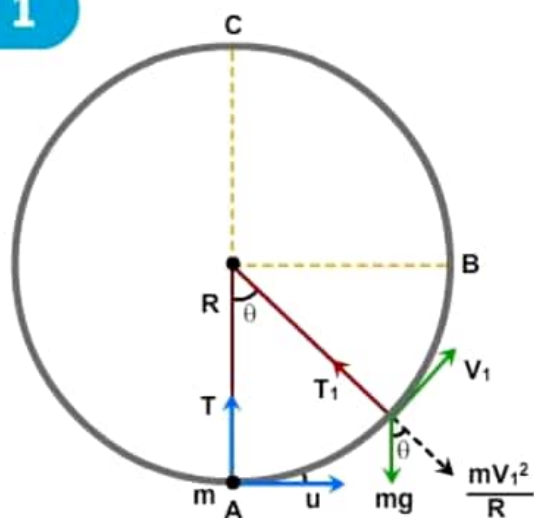# VERTICAL CIRCULAR MOTION

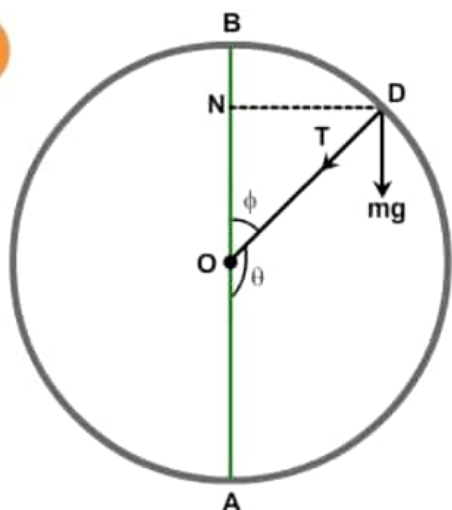## 1

Ball will complete the circle

Condition: Initial velocity, $u > \sqrt{5gR}$

- Tension at A : $T_A = 6mg$

- Tension at B : $T_B = 3mg$

- If $u = \sqrt{5gR}$ ball will just complete the circle and velocity at topmost point is
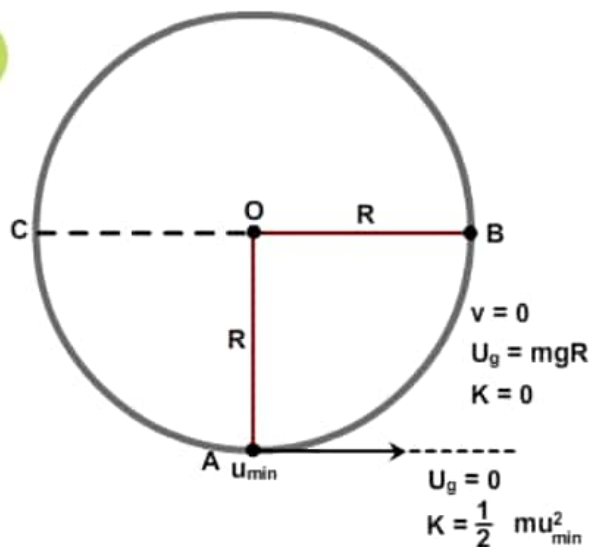 $v = \sqrt{gR}$

2

Ball will slack in between

Condition: $\sqrt{2gR} < u < \sqrt{5gR}$

- $\cos \phi = \dfrac{u^2 - 2gR}{3gR} \cdot v$

3

Ball will reach B

Condition: $u \leq \sqrt{2gR}$

- Ball will oscillate between CAB

- Velocity $v = 0$ but $T \neq 0$

Note: At height **h** from bottom of ball velocity will be, $v = \sqrt{u^2 - 2gh}$