

From (2) $m\omega^2 R = 4$

$\Rightarrow (m\omega R)\omega = 4$

$\Rightarrow \boxed{\omega = 4}$ [From (3)]

(Hard) A car is moving in a circular horizontal track of radius 10m with a constant speed of 10m/s. A plumb bob is suspended from the roof of the car by a light rigid rod. The angle made by the rod with the track is ($g = 10\text{m/s}^2$)

- (A) 0 (B) 30° (C) 45° (D) 60°

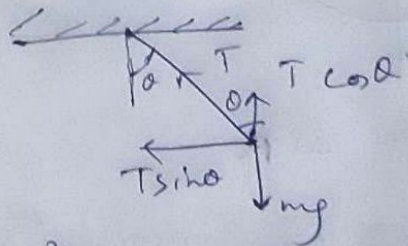
Ans: (C)

Concepts Used :-

① Circular motion.

Formulae Used

① $F_{\text{centripetal}} = \frac{mv^2}{R}$



$T \sin \theta = \frac{mv^2}{R}$ → Radius of circular track

$T \cos \theta = mg$

$\therefore \tan \theta = \frac{v^2}{Rg} = 1 \Rightarrow \boxed{\theta = 45^\circ}$