

1. A particle of mass m is suspended from a ceiling through a string of length L . The particle moves in a horizontal circle of

radius r such that $r = \frac{L}{\sqrt{2}}$. The speed of particle will be :

[Aug. 26, 2021 (II)]

(a) \sqrt{rg}

(b) $\sqrt{2rg}$

(c) $2\sqrt{rg}$

(d) $\sqrt{\frac{rg}{2}}$

ans (a) Here, $R = 0.1$ m

$$\omega = \frac{2\pi}{T} = \frac{2\pi}{60} = 0.105 \text{ rad/s}$$

Acceleration of the tip of the clock second's hand,

$$a = \omega^2 R = (0.105)^2 (0.1) = 0.0011 = 1.1 \times 10^{-3} \text{ m/s}^2$$

Hence, average acceleration is of the order of 10^{-3} .