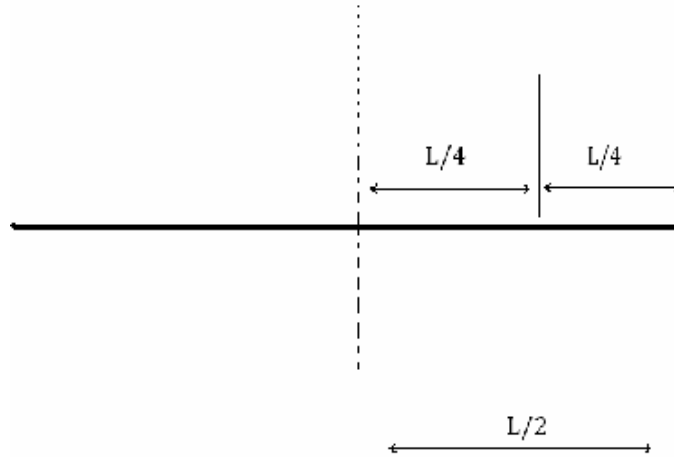


QUESTION

Find the moment of inertia of a uniform rod of length L about an axis perpendicular to its end passing through a point at distance $L/4$ from an end

SOLUTION:

According to the parallel axis theorem, the moment of inertia of a rod about an axis perpendicular to its end passing through a point at distance $L/4$ from an end is:

$$I = I_0 + m\left(\frac{L}{4}\right)^2$$

Where

$I_0 = \frac{m \cdot L^2}{12}$ - the moment of inertia of a rod about an axis through its center of mass.

Hence

$$I = \frac{m \cdot L^2}{12} + m\left(\frac{L}{4}\right)^2 = \frac{4m \cdot L^2 + 3m \cdot L^2}{48} = \frac{7m \cdot L^2}{48}$$

ANSWER

$$I = \frac{7m \cdot L^2}{48}$$