

QUES 05

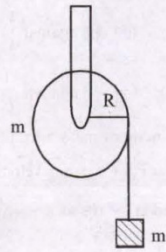
A mass 'm' is supported by a massless string wound around a uniform hollow cylinder of mass m and radius R. If the string does not slip on the cylinder, with what acceleration will the mass fall or release? [Main 2014]

(a)  $\frac{2g}{3}$

(b)  $\frac{g}{2}$

(c)  $\frac{5g}{6}$

(d) g



(b) From figure,  
Acceleration  $a = R\alpha$  ... (i)  
and  $mg - T = ma$  ... (ii)  
From equation (i) and (ii)

$$T \times R = mR^2\alpha = mR^2 \left( \frac{a}{R} \right)$$

or  $T = ma$

$$\Rightarrow mg - ma = ma$$

$$\Rightarrow a = \frac{g}{2}$$

