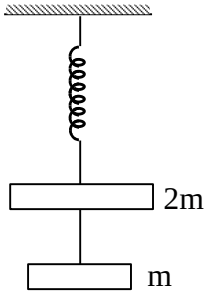
The string between mass m and 2m is inextensible and light and the spring is ideal. If the string is cut the magnitudes of accelerations of mass 2m and m are respectively,



(a) g, g

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

(c) $\frac{g}{2}, g$

(d) $\frac{g}{2}, \frac{g}{2}$

Solution

Initially the spring force kx = 3mg (before the string is cut)

Just after the string is cut for block 2m,

$kx - 2mg = 2ma_1$

$\Rightarrow 3mg - 2mg = 2ma_1$

$\Rightarrow a_1 = \frac{g}{2}$ (upward direction)

For block of mass m,

$mg = ma_2$

or $a_2 = g$ (downward acceleration just like freely falling body)

$\therefore$ (c)