CONNECTED BODIES

2011

34. **Two bodies of masses 4kg and 6kg are tied to the ends of a mass less string. The string passes over a frictionless pulley. The acceleration of the system is**
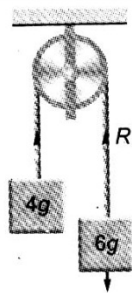
a) $\dfrac{g}{2}$ b) $\dfrac{g}{3}$ c) $\dfrac{g}{5}$ d) $\dfrac{g}{10}$

34. From the figure

For mass 4kg $T - 4g = 4f$ ….(i)

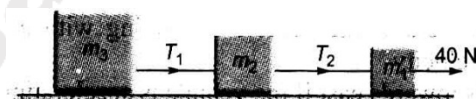For mass 6kg $6g - T = 6f$……..(ii)

Adding both equations, we get

$2g = 10 f$

$f = \dfrac{g}{5}$

2005

43. **Three blocks of masses m_1, m_2 and m_3 are connected by mass less strings as shown on a frictionless table. They are pulled with a force of 40N. If $m_1 = 10kg$, $m_2 = 6kg$ and $m_3 = 4kg$, then tension T_2 will be**

a) 10N b) 20N c) 32N d) 40N

43. Since, the table is frictionless ie, it is smooth therefore, force on the blocks is given by

$F = (m_1 + m_2 + m_3)a$

$\Rightarrow a = \dfrac{F}{m_1 + m_2 + m_3} = \dfrac{40}{10 + 6 + 4} = \dfrac{40}{20} = 2ms^{-2}$

Now the tension between 10kg and 6kg masses is given by

$T_2 = (m_1 + m_2)a = (10 + 6)\,2 = 16 \times 2 = 32N$