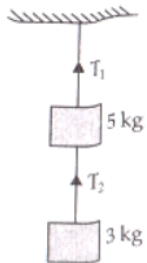
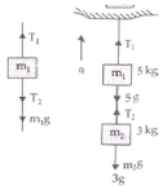


### QUES 05

Two masses of 5 kg and 3 kg are suspended with help of massless inextensible strings as shown in Figure. Calculate  $T_1$  and  $T_2$  when whole system is going upwards with acceleration =  $2 \text{ ms}^{-2}$  (use  $g = 9.8 \text{ ms}^{-2}$ )



**Sol.** As the whole system is going up with acceleration =  $a = 2 \text{ ms}^{-2}$   
As given that,  $m_1 = 5 \text{ kg}$ ,  $m_2 = 3 \text{ kg}$ ,  $g = 9.8 \text{ m/s}^2$



Tension in a string is equal and opposite in all parts of a string.

For the upper block of mass 5 kg, the forces on mass  $m_1$

$$T_1 - T_2 - m_1 g = m_1 a$$

$$T_1 - T_2 - 5g = 5a$$

$$T_1 - T_2 = 5(g + a)$$

For the lower block of mass 3 kg, the force on mass

$$T_2 - m_2 g = m_2 a$$

$$T_2 = m_2 (g + a) = 3(9.8 + 2) = 3 \times 11.8$$

$$T_2 = 35.4 \text{ N}$$

$$T_1 = T_2 + 5(g+a)$$

$$\Rightarrow T_1 = 35.4 + 5(9.8+2) = 94.4 \text{ N}$$