

**Answer on Question#36818 – Physics - Mechanics | Kinematics | Dynamics**

A string tied on roof can bear maximum tension of 50 kg wt .the minimum acceleration that can be acquired by man of 98 kg to descend will be  $g=9.8 \text{ m/s}^2$

**Solution:**

$m = 50 \text{ kg}$  – maximum tension weight of the string;

$M = 98\text{kg}$  – weight of the man;

$T_{max} = mg$  – maximum tension force of the string;

Newton's second law for the string (along Y-axis):

$$y: Mg - T_{max} = Ma_{min}$$

$$a_{min} = \frac{Mg - T_{max}}{M} = \frac{Mg - mg}{M} = \frac{g(M - m)}{M} = \frac{9.8 \frac{m}{s^2} (98\text{kg} - 50\text{kg})}{98\text{kg}} = 4.8 \frac{m}{s^2}$$

**Answer:** minimum acceleration is equal to  $4.8 \frac{m}{s^2}$ .