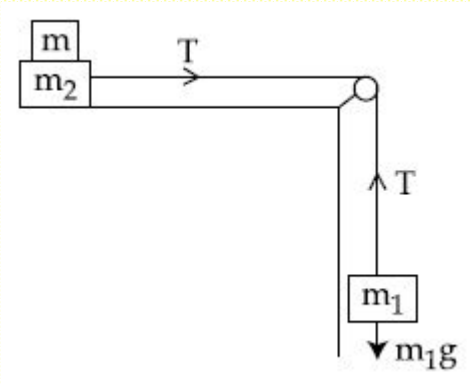


Two masses $m_1=5$ kg and $m_2=10$ kg, connected by an inextensible string over a frictionless pulley, are moving as shown in the figure. The coefficient of friction of horizontal surface is 0.15. The minimum weight m that should be put on top of m_2 to stop the motion is:



- (1) 18.3 kg
- (2) 27.3 kg
- (3) 43.3 kg
- (4) 10.3 kg

Let us first solve the problem to make the acceleration 0. Any mass more than this mass that makes the acceleration 0 should be able to stop the motion.

$$m_1g = T$$

$$T = fr = \mu N = \mu(m + m_2)g$$

$$\therefore m_1g = \mu(m + m_2)g$$

$$\therefore m = \frac{m_1}{\mu} - m_2 = \frac{5}{0.15} - 10 = 23.3 \text{ kg}$$

Out of the options given, the minimum mass greater than 23.3 kg is 27.3 kg.

Hence, Option (2).

Based on JEE Main 2018 - [123IITJEE](#)