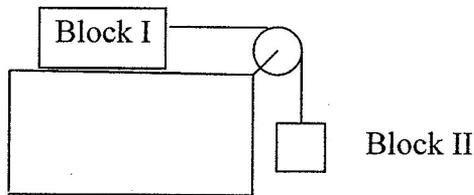


1. What is the acceleration of the system below? What is the tension in the cord? The horizontal surface has no friction.

Block I: $m_1 = 20 \text{ kg}$,
Block II: $m_2 = 5 \text{ kg}$,



For full credit,

1. you must draw free body diagrams for both masses below
2. you must draw and label all forces on the free body diagrams
3. you must apply Newton's second law to each free body diagram
4. solve for the acceleration and tension



$$x: F_T = m_1 a$$

$$y: F_T - m_2 g = -m_2 a$$

$$y: F_N - F_{G1} = 0$$

$$F_N = m_1 g$$

COMBINING:

$$m_1 a - m_2 g = -m_2 a$$

$$m_1 a + m_2 a = m_2 g = a (m_1 + m_2)$$

$$a = \frac{m_2 g}{m_1 + m_2} = \left(\frac{5 \text{ kg}}{5 \text{ kg} + 20 \text{ kg}} \right) 9.8 \text{ m/s}^2 = \boxed{2 \text{ m/s}^2}$$

$$F_T = m_1 a = (20 \text{ kg})(2 \text{ m/s}^2) = \boxed{40 \text{ N}}$$