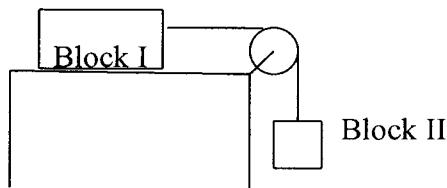


Name: Key

SP211 qUIZ

1. What is the acceleration of the system below? What is the tension in the cord?

Block I:  $m_1 = 20 \text{ kg}$ , Block II:  $m_2 = 5 \text{ kg}$ , coefficient of kinetic friction = 0.2.



$$\sum F_{y_1} = N - m_1 g = 0$$

$$N = m_1 g = (20 \text{ kg})(9.8 \text{ m/s}^2) = 196 \text{ N}$$

$$F_{fr} = \mu_k N = (.2)(196 \text{ N}) = 39.2 \text{ N}$$

$$\sum F_{x_1} = T - F_{fr} = m_1 a$$

$$T - 39.2 \text{ N} = (20 \text{ kg})a$$

$$T = 39.2 \text{ N} + (20 \text{ kg})a$$

$$T = 39.2 \text{ N} + (20 \text{ kg})(392 \text{ m/s}^2)$$

$$= \boxed{47.0 \text{ N}}$$

$$\sum F_{y_2} = m_2 g - T = m_2 a$$

$$(5 \text{ kg})(9.8 \text{ m/s}^2) - T = (5 \text{ kg})a$$

$$49 \text{ N} - T = (5 \text{ kg})a$$

$$49 \text{ N} - 39.2 \text{ N} - (20 \text{ kg})a = (5 \text{ kg})a$$

$$9.8 \text{ N} = (25 \text{ kg})a$$

$$a = \boxed{392 \text{ m/s}^2}$$