Physics 161 (Fall 2018)
Quiz #5 (3-Oct-2018)

Circle the one correct answer for each of the five questions below. Each question is worth 2 points. You may not use a calculator.

1. Two objects having masses $m_1$ and $m_2$ are connected to each other as shown in the figure and are released from rest. There is no friction on the table surface or in the pulley. The masses of the pulley and the string connecting the objects are completely negligible. What must be true about the tension $T$ in the string just after the objects are released?

(a) $T = m_1 g$
(b) $T > m_1 g$
(c) $T < m_2 g$
(d) $T = m_2 g$
(e) $T > m_2 g$

2. A brick is resting on a rough incline as shown in the figure. The friction force acting on the brick, along the incline, is

(a) zero.
(b) less than the weight of the brick, but greater than zero.
(c) equal to the weight of the brick.
(d) greater than the weight of the brick.
(e) impossible to tell without knowing the coefficient of static friction.
3. Two men, Joel and Jerry, push against a wall. Jerry stops after 10 min, whereas Joel is able to push for 5.0 min longer. Compare the work they do.

(a) Both men do positive work, but Joel does 25\% more work than Jerry.
(b) Both men do positive work, but Joel does 50\% more work than Jerry.
(c) Both men do positive work, but Joel does 75\% more work than Jerry.
(d) Both men do positive work, but Jerry does 50\% more work than Joel.
(e) Neither of them does any work.

4. An object moves in a circle at constant speed. The work done by the centripetal force is zero because

(a) the displacement for each revolution is zero.
(b) the average force for each revolution is zero.
(c) there is no friction.
(d) the magnitude of the acceleration is zero.
(e) the centripetal force is perpendicular to the velocity.

5. Consider two dimensionless vectors: \( \vec{A} = 3\hat{x} - 4\hat{y} \) and \( \vec{B} = 2\hat{x} + 5\hat{y} \). What is the dot product \( \vec{A} \cdot \vec{B} \)?

(a) \(-14\)
(b) \(26\)
(c) \(5\hat{x} + \hat{y}\)
(d) \(6\hat{x} - 20\hat{y}\)
(e) \(6\hat{x} + 20\hat{y}\)