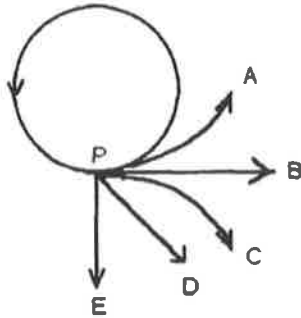## Chapter 5 review

5.1 Conceptual Questions

____ 1) A girl attaches a rock to a string, which she then swings counter-clockwise in a horizontal circle. The string breaks at point P in the figure, which shows a bird's-eye view (as seen from above). Which path (A-E) will the rock follow?

- A) Path A
- B) Path B
- C) Path C
- D) Path D
- E) Path E

____ 2) You are in a train traveling on a horizontal track and notice that a piece of luggage starts to slide directly toward the front of the train. From this observation, you can conclude that this train is
- A) speeding up.
- B) slowing down.
- C) changing direction.
- D) speeding up and changing direction.
- E) slowing down and changing direction.

____ 3) An elevator suspended by a vertical cable is moving downward but slowing down. The tension in the cable must be
- A) greater than the weight of the elevator.
- B) less than than the weight of the elevator.
- C) equal to the weight of the elevator.

____ 4) A crate is sliding down an inclined ramp at a constant speed of 0.55 m/s. The vector sum of all the forces acting on this crate must point
- A) down the ramp.
- B) up the ramp.
- C) perpendicular to the ramp.
- D) vertically downward.
- E) None of the above choices is correct.

_____ 5) An object is moving with constant non-zero velocity. Which of the following statements about it *must* be true?
A) A constant force is being applied to it in the direction of motion.
B) A constant force is being applied to it in the direction opposite of motion.
C) A constant force is being applied to it perpendicular to the direction of motion.
D) The net force on the object is zero.
E) Its acceleration is in the same direction as it velocity.

_____ 6) You are standing in a moving bus, facing forward, when you suddenly slide forward as the bus comes to an immediate stop. What force caused you to slide forward?
A) gravity
B) the normal force due to your contact with the floor of the bus
C) the force due to friction between you and the floor of the bus
D) There is *not* a force causing you to slide forward.

_____ 7) A fireman is sliding down a fire pole. As he speeds up, he tightens his grip on the pole, thus increasing the vertical frictional force that the pole exerts on the fireman. When the force on his hands equals his weight, what happens to the fireman?
A) The fireman comes to a stop.
B) The fireman descends with slower and slower speed.
C) The fireman descends with a smaller but non-zero acceleration.
D) The fireman continues to descend, but with constant speed.
E) The acceleration of the fireman is now upward.

5.2 Problems

_____ 8) If a net force accelerates a 4.5-kg tool at 40 m/s², what acceleration would that same net force give to an 18-kg tool?
A) 180 m/s²
B) 10 m/s²
C) 160 m/s²
D) 9.8 m/s²
E) 32 m/s²

9) A 590-kg rocket is at rest on the launch pad. What upward thrust force is needed to accelerate the rocket uniformly to an upward speed of 28 m/s in 3.3 s?

10) A 10-kg object is hanging by a very light wire in an elevator that is traveling upward. The tension in the rope is measured to be 75 N. What are the magnitude and direction of the acceleration of the elevator?

_____ 11) A 45.0-kg person steps on a scale in an elevator. The scale reads 460 N. What is the magnitude of the acceleration of the elevator?
A) 4.91 m/s²
B) 9.81 m/s²
C) 46.9 m/s²
D) 0.206 m/s²
E) 0.422 m/s²

Chapter 5 review
Answer Section

1) ANS: B   PTS: 1   REF: Var: 1
2) ANS: B   PTS: 1   REF: Var: 1
3) ANS: A   PTS: 1   REF: Var: 1
4) ANS: E   PTS: 1   REF: Var: 1
5) ANS: D   PTS: 1   REF: Var: 1
6) ANS: D   PTS: 1   REF: Var: 1
7) ANS: D   PTS: 1   REF: Var: 1
8) ANS: B   PTS: 1   REF: Var: 1
9) ANS:
    1.1×104 N

    PTS: 1   REF: Var: 1
10) ANS:
    2.3m/s^2, downward

    PTS: 1   REF: Var: 1
11) ANS: E   PTS: 1   REF: Var: 1