Ch3MidYrReview

3.1 Conceptual Questions

_____ 1) If the velocity of an object is zero at some point, then its acceleration must also be zero at that point.
A) True
B) False

_____ 2) Which of the following situations is *impossible*?
A) An object has velocity directed east and acceleration directed west.
B) An object has velocity directed east and acceleration directed east.
C) An object has zero velocity but non-zero acceleration.
D) An object has constant non-zero acceleration and changing velocity.
E) An object has constant non-zero velocity and changing acceleration.

_____ 3) If the acceleration of an object is zero, then that object cannot be moving.
A) True
B) False

_____ 4) If the velocity of an object is zero, then that object cannot be accelerating.
A) True
B) False

_____ 5) Suppose that a car traveling to the west begins to slow down as it approaches a traffic light. Which of the following statements about its acceleration is correct?
A) The acceleration is toward the east.
B) Since the car is slowing down, its acceleration must be negative.
C) The acceleration is zero.
D) The acceleration is toward the west.

_____ 6) Suppose that a car traveling to the east (+x direction) begins to slow down as it approaches a traffic light. Which statement concerning its acceleration must be correct?
A) Its acceleration is in the +x direction.
B) Its acceleration is in the -x direction.
C) Its acceleration is zero.
D) Its acceleration is decreasing in magnitude as the car slows down.

_____ 7) Suppose that a car traveling to the west (-x direction) begins to slow down as it approaches a traffic light. Which statement concerning its acceleration must be correct?
A) Its acceleration is positive.
B) Its acceleration is negative.
C) Its acceleration is zero.
D) Its acceleration is decreasing in magnitude as the car slows down.

_____ 8) Suppose that an object is moving with a constant velocity. Which statement concerning its acceleration must be correct?
A) The acceleration is constantly increasing.
B) The acceleration is constantly decreasing.
C) The acceleration is a constant non-zero value.
D) The acceleration is equal to zero.

_____ 9) If the velocity of an object is zero at one instant, what is true about the acceleration of that object? (There could be more than one correct choice.)
   A) The acceleration could be positive.
   B) The acceleration could be negative.
   C) The acceleration could be zero.
   D) The acceleration must be zero.

_____ 10) When a ball is thrown straight up with no air resistance, the acceleration at its highest point
   A) is upward
   B) is downward
   C) is zero
   D) reverses from upward to downward
   E) reverses from downward to upward

_____ 11) A rock from a volcanic eruption is launched straight up into the air with no appreciable air resistance. Which one of the following statements about this rock while it is in the air is correct?
   A) On the way up, its acceleration is downward and its velocity is upward, and at the highest point both its velocity and acceleration are zero.
   B) On the way down, both its velocity and acceleration are downward, and at the highest point both its velocity and acceleration are zero.
   C) Throughout the motion, the acceleration is downward, and the velocity is always in the same direction as the acceleration.
   D) The acceleration is downward at all points in the motion.
   E) The acceleration is downward at all points in the motion except that is zero at the highest point.

_____ 12) Suppose a ball is thrown straight up and experiences no appreciable air resistance. What is its acceleration just before it reaches its highest point?
   A) zero
   B) slightly less than g
   C) exactly g
   D) slightly greater than g

_____ 13) A ball is thrown straight up, reaches a maximum height, then falls to its initial height. Which of the following statements about the direction of the velocity and acceleration of the ball as it is *going up* is correct?
   A) Both its velocity and its acceleration point upward.
   B) Its velocity points upward and its acceleration points downward.
   C) Its velocity points downward and its acceleration points upward.
   D) Both its velocity and its acceleration points downward.

_____ 14) A 10-kg rock and 20-kg rock are dropped from the same height and experience no significant air resistance. If it takes the 20-kg rock a time T to reach the ground, what time will it take the 10-kg rock to reach the ground?
   A) $4T$
   B) $2T$
   C) T
   D) $T/2$
   E) $T/4$

_____ 15) Two objects are dropped from a bridge, an interval of 1.0 s apart. Air resistance is negligible. During the time that both objects continue to fall, their separation
   A) increases.
   B) decreases.
   C) stays constant.
   D) increases at first, but then stays constant.
   E) decreases at first, but then stays constant.

_____ 16) Brick A is dropped from the top of a building. Brick B is thrown straight down from the same building, and neither one experiences appreciable air resistance. Which statement about their accelerations is correct?
   A) The acceleration of A is greater than the acceleration of B.
   B) The acceleration of B is greater than the acceleration of A.
   C) The two bricks have exactly the same acceleration.
   D) Neither brick has any acceleration once it is released.

_____ 17) An object is moving with constant non-zero acceleration in the +x direction. The velocity versus time graph of this object is
   A) a horizontal straight line.
   B) a vertical straight line.
   C) a straight line making an angle with the time axis.
   D) a parabolic curve.

_____ 18) The slope of a position versus time graph gives
   A) the distance traveled.
   B) velocity.
   C) acceleration.
   D) displacement.

_____ 19) The slope of a velocity versus time graph gives
   A) the distance traveled.
   B) velocity.
   C) acceleration.
   D) displacement.

____ 20) The figure shows a graph of the position x of two cars, C and D, as a function of time t.
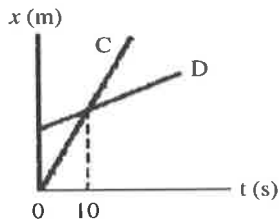
According to this graph, which statements about these cars must be true? (There could be more than one correct choice.)

A) The magnitude of the acceleration of car C is greater than the magnitude of the acceleration of car D.
B) The magnitude of the acceleration of car C is less than the magnitude of the acceleration of car D.
C) At time $t = 10$ s, both cars have the same velocity.
D) Both cars have the same acceleration.
E) The cars meet at time $t = 10$ s.

Ch3MidYrReview
Answer Section

1) ANS: B   PTS: 1   REF: Var: 1
2) ANS: E   PTS: 1   REF: Var: 1
3) ANS: B   PTS: 1   REF: Var: 1
4) ANS: B   PTS: 1   REF: Var: 1
5) ANS: A   PTS: 1   REF: Var: 1
6) ANS: B   PTS: 1   REF: Var: 1
7) ANS: A   PTS: 1   REF: Var: 1
8) ANS: D   PTS: 1   REF: Var: 1
9) ANS: A, B, C   PTS: 1   REF: Var: 1
10) ANS: B   PTS: 1   REF: Var: 1
11) ANS: D   PTS: 1   REF: Var: 1
12) ANS: C   PTS: 1   REF: Var: 1
13) ANS: B   PTS: 1   REF: Var: 1
14) ANS: C   PTS: 1   REF: Var: 1
15) ANS: A   PTS: 1   REF: Var: 1
16) ANS: C   PTS: 1   REF: Var: 1
17) ANS: C   PTS: 1   REF: Var: 1
18) ANS: B   PTS: 1   REF: Var: 1
19) ANS: C   PTS: 1   REF: Var: 1
20) ANS: D, E   PTS: 1   REF: Var: 1