Practice Ch 3 Linear Motion

1) The two measurements necessary for calculating average speed are
A) acceleration and time.
B) velocity and time.
C) distance and time.
D) distance and acceleration.
E) velocity and distance.
Answer: C

2) A car maintains a constant velocity of 100 km/hr for 10 seconds. During this interval its acceleration is
A) zero.
B) 10 km/hr.
C) 110 km/hr.
D) 1000 km/hr.
Answer: A

3) A hockey puck is set in motion across a frozen pond. If ice friction and air resistance are neglected, the force required to keep the puck sliding at constant velocity is
A) zero.
B) equal to its weight.
C) equal to its weight divided by its mass.
D) equal to the product of its mass times its weight.
Answer: A

4) If an object falling freely were somehow equipped with an odometer to measure the distance it travels, then the amount of distance it travels each succeeding second would be
A) constant.
B) less and less each second.
C) greater than the second before.
D) doubled.
Answer: C

5) If a freely falling object were somehow equipped with a speedometer on a planet where the acceleration due to gravity is 20 m/s/s, then its speed reading would increase each second by
A) 10 m/s.
B) 20 m/s.
C) 30 m/s.
D) 40 m/s.
E) depends on its initial speed
Answer: B

6) If an object moves with constant acceleration, its velocity must
A) be constant also.
B) change by the same amount each second.
C) change by varying amounts depending on its speed.
D) always decrease.
7) If a rocket initially at rest accelerates at a rate of 50 m/s$^2$ for one minute, its speed will be
A) 50 m/s.
B) 500 m/s.
C) 3000 m/s.
D) 3600 m/s.
Answer: C

8) It takes 6 seconds for a stone to fall to the bottom of a mine shaft. How deep is the shaft?
A) about 60 m
B) about 120 m
C) about 180 m
D) more than 200 m
Answer: C

9) A car accelerates at 2 meters/s/s. Assuming the car starts from rest, how far will it travel in 10 s?
A) 2 m
B) 10 m
C) 40 m
D) 100 m
E) 200 m
Answer: D

10) A ball tossed vertically upward rises, reaches its highest point, and then falls back to its starting point. During this time the acceleration of the ball is always
A) in the direction of motion.
B) opposite its velocity.
C) directed upward.
D) directed downward.
Answer: D

11) If a car accelerates from rest at 2 meters per second per second, its speed 3 seconds later will be about
A) 2 m/s.
B) 3 m/s.
C) 4 m/s.
D) 6 m/s.
Answer: D

12) An object covers a distance of 8 meters in the first second of travel, another 8 meters during the next second, and 8 meters again during the third second. Its acceleration in meters per second per second is approximately
A) 0.
B) 5.
C) 8.
D) 24.
13) At one instant a heavy object in air is moving upward at 50 meters per second. One second later its speed is approximately
A) 40 m/s.
B) 50 m/s.
C) 55 m/s.
D) 60 m/s.
Answer: A

14) A ball is thrown upwards and caught when it comes back down. In the presence of air resistance, the speed with which it is caught is always
A) more than the speed it had when thrown upwards.
B) less than the speed it had when thrown upwards.
C) the same as the speed it had when thrown upwards.
D) impossible to determine.
Answer: B

15) One half second after starting from rest, a freely falling object will have a speed of about
A) 20 m/s.
B) 10 m/s.
C) 5 m/s.
D) 2.5 m/s.
E) none of these
Answer: C

16) An object falls freely from rest on a planet where the acceleration due to gravity is twice as much as it is on Earth. In the first 5 seconds it falls a distance of
A) 100 m.
B) 150 m.
C) 250 m.
D) 500 m.
E) none of these
Answer: C

17) It takes 6 seconds for a stone to fall to the bottom of a mine shaft. How deep is the shaft?
A) about 60 m
B) about 120 m
C) about 180 m
D) more than 200 m
Answer: C
18) In each second of fall, the distance a freely falling object will fall is
   A) about 5 m.
   B) about 10 m.
   C) the same, but not 5 m or 10 m.
   D) increasing.
   E) none of these
   Answer:  D

19) If a projectile is fired straight up at a speed of 10 m/s, the total time to return to its starting position is about
   A) 1 second.
   B) 2 seconds.
   C) 10 seconds.
   D) 20 seconds.
   E) not enough information to estimate
   Answer:  B

20) Disregarding air drag, how fast must you toss a ball straight up in order for it to take 2 seconds to return to the level from which you tossed it?
   A) 5 m/s
   B) 7.5 m/s
   C) 10 m/s
   D) 15 m/s
   E) 20 m/s
   Answer:  C