Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Ch 2 Linear Motion Practice Test

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Displacement is which of the following types of quantities?
   a. vector
   b. scalar
   c. magnitude
   d. dimensional
2. A truck moves 70 m east, then moves 120 m west, and finally moves east again a distance of 90 m. If east is chosen as the positive direction, what is the truck's resultant displacement?
   a. 40 m
   b. - 40 m
   c. 280 m
   d. -280 m
   e. 230 m
3. Which of the following is not a vector quantity?
   a. temperature
   b. velocity
   c. acceleration
   d. displacement
   e. force
4. In one-dimensional motion, the average speed of an object that moves from one place to another and then back to its original place has which of the following properties?
   a. It is positive.
   b. It is negative.
   c. It is zero.
   d. It can be positive, negative, or zero.
   e. It isn't zero.
5. An object moves 20 m east in 30 s and then returns to its starting point taking an additional 50 s. If west is chosen as the positive direction, what is the sign associated with the average velocity of the object?
   a. +
   b. –
   c. 0 (no sign)
   d. any of the above
   e. It isn't zero.
6. An object moves 20 m east in 30 s and then returns to its starting point taking an additional 50 s. If west is chosen as the positive direction, what is the average speed of the object?
   a. 0.50 m/s
   b. -0.50 m/s
   c. 0.73 m/s
   d. 0 m/s
   e. -0.73 m/s

7. A cheetah can run at approximately 100 km/hr and a gazelle at 80.0 km/hr. If both animals are running at full speed, with the gazelle 70.0 m ahead, how long before the cheetah catches its prey?
   a. 12.6 s
   b. 25.2 s
   c. 6.30 s
   d. 10.7 s
   e. 20.3 s
8. A cheetah can maintain its maximum speed of 100 km/hr for 30.0 seconds. What minimum distance must a gazelle running 80.0 km/hr be ahead of the cheetah to escape?
   a. 100 m
   b. 167 m
   c. 70.0 m
   d. 83.0 m
   e. 184 m
9. A railroad train travels forward along a straight track at 80.0 m/s for 1 000 m and then travels at 50.0 m/s for the next 1 000 m. What is the average velocity?
   a. 65.0 m/s
   b. 61.5 m/s
   c. 63.7 m/s
   d. 70.0 m/s
   e. 68.3 m/s
10. A ball is pushed with an initial velocity of 4.0 m/s. The ball rolls down a hill with a constant acceleration of 1.6 m/s^2. The ball reaches the bottom of the hill in 8.0 s. What is the ball's velocity at the bottom of the hill?
    a. 10 m/s
    b. 12 m/s
    c. 16 m/s
    d. 17 m/s
    e. 19 m/s
11. A bird, accelerating from rest at a constant rate, experiences a displacement of 28 m in 11 s. What is its acceleration?
    a. 0.21 m/s^2
    b. 0.46 m/s^2
    c. 0.64 m/s^2
    d. 0.78 m/s^2
    e. 0.97 m/s^2
12. A European sports car dealer claims that his product will accelerate at a constant rate from rest to a speed of 100 km/hr in 8.00 s. What distance will the sports car travel during the 8 s acceleration period? (*Hint:* First convert speed to m/s.)
    a. 55.5 m
    b. 77.7 m
    c. 111 m
    d. 222 m
    e. 268 m

13. An automobile driver puts on the brakes and decelerates from 30.0 m/s to zero in 10.0 s. What distance does the car travel?
    a. 150 m
    b. 196 m
    c. 336 m
    d. 392 m
    e. 421 m
14. A Cessna aircraft has a lift-off speed of 120 km/hr. What minimum constant acceleration does this require if the aircraft is to be airborne after a take-off run of 240 m?
    a. 2.31 m/s^2
    b. 3.63 m/s^2
    c. 4.63 m/s^2
    d. 5.55 m/s^2
    e. 6.12 m/s^2
15. If the displacement of an object is given in SI units by $\Delta x = -3\ t + 4\ t^2$, at $t = 2$ s its velocity and acceleration are, respectively:
    a. positive, positive.
    b. positive, negative.
    c. negative, negative.
    d. negative, positive.
    e. negative, zero.
16. A rock is thrown straight up with an initial velocity of 24.5 m/s. What maximum height will the rock reach before starting to fall downward? (Take acceleration due to gravity as 9.80 m/s^2.)
    a. 9.80 m
    b. 19.6 m
    c. 24.5 m
    d. 30.6 m
    e. 35.3 m
17. A rock, released at rest from the top of a tower, hits the ground after 1.5 s. What is the speed of the rock as it hits the ground? (g = 9.8 m/s^2 and air resistance is negligible)
    a. 15 m/s
    b. 20 m/s
    c. 31 m/s
    d. 39 m/s
    e. 40 m/s
18. John throws a rock down with speed 14 m/s from the top of a 30-m tower. If g = 9.8 m/s^2 and air resistance is negligible, what is the rock's speed just as it hits the ground?
    a. 12 m/s
    b. 28 m/s
    c. 39 m/s
    d. 350 m/s
    e. 784 m/s

19. At the top of a cliff 100 m high, Raoul throws a rock upward with velocity 15.0 m/s. How much later should he drop a second rock from rest so both rocks arrive simultaneously at the bottom of the cliff?
    a. 5.05 s
    b. 3.76 s
    c. 2.67 s
    d. 1.78 s
    e. 1.56 s
20. Mt. Everest is more than 8 000 m high. How fast would an object be moving if it could free fall to sea level after being released from an 8000-m elevation? (Ignore air resistance.)
    a. 396 m/s
    b. 120 m/s
    c. 1 200 m/s
    d. 12 000 m/s
    e. 521 m/s

Ch 2 Linear Motion Practice Test
Answer Section

MULTIPLE CHOICE

1. A
2. A
3. A
4. A
5. C
6. A
7. A
8. B
9. B
10. D
11. B
12. C
13. A
14. A
15. A
16. D
17. A
18. B
19. D
20. A