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

Chapter 6 Review

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ 1. Which of the following has the greatest momentum?
a. tortoise with a mass of 270 kg moving at a velocity of 0.5 m/s
b. hare with a mass of 2.7 kg moving at a velocity of 7 m/s
c. turtle with a mass of 91 kg moving at a velocity of 1.4 m/s
d. roadrunner with a mass of 1.8 kg moving at a velocity of 6.7 m/s

____ 2. A baseball is pitched very fast. Another baseball of equal mass is pitched very slowly. Which of the following statements is correct?
a. The fast-moving baseball is harder to stop because it has more momentum.
b. The slow-moving baseball is harder to stop because it has more momentum.
c. The fast-moving baseball is easier to stop because it has more momentum.
d. The slow-moving baseball is easier to stop because it has more momentum.

____ 3. A roller coaster climbs up a hill at 4 m/s and then zips down the hill at 30 m/s. The momentum of the roller coaster
a. is greater up the hill than down the hill.
b. is greater down the hill than up the hill.
c. remains the same throughout the ride.
d. is zero throughout the ride.

____ 4. A force is applied to stop a moving shopping cart. Increasing the time interval over which the force is applied
a. requires a greater force.
b. has no effect on the force needed.
c. requires a smaller force.
d. requires the same force.

____ 5. A rubber ball with a mass of 0.30 kg is dropped onto a steel plate. The ball's velocity just before impact is 4.5 m/s and just after impact is 4.2 m/s. What is the change in the ball's momentum?
a. –0.09 kg•m/s
b. –2.6 kg•m/s
c. –4.0 kg•m/s
d. –12 kg•m/s

____ 6. A ball with a mass of 0.15 kg and a velocity of 5.0 m/s strikes a wall and bounces straight back with a velocity of 3.0 m/s. What is the change in momentum of the ball?
a. –0.30 kg•m/s
b. –1.20 kg•m/s
c. –0.15 kg•m/s
d. –7.50 kg•m/s

____ 7. A large moving ball collides with a small stationary ball. The momentum
a. of the large ball decreases, and the momentum of the small ball increases.
b. of the small ball decreases, and the momentum of the large ball increases.
c. of the large ball increases, and the momentum of the small ball decreases.
d. does not change for either ball.

____ 8. A rubber ball moving at a speed of 5 m/s hit a flat wall and returned to the thrower at 5 m/s. The magnitude of the momentum of the rubber ball
a. increased.
b. decreased.
c. remained the same.
d. was not conserved.

____ 9. Two swimmers relax close together on air mattresses in a pool. One swimmer's mass is 48 kg, and the other's mass is 55 kg. If the swimmers push away from each other,
a. their total momentum triples.
b. their momenta are equal but opposite.
c. their total momentum doubles.
d. their total momentum decreases.

____ 10. A soccer ball collides with another soccer ball at rest. The total momentum of the balls
a. is zero.
b. increases.
c. remains constant.
d. decreases.

____ 11. Which of the following statements about the conservation of momentum is NOT correct?
a. Momentum is conserved for a system of objects pushing away from each other.
b. Momentum is not conserved for a system of objects in a head-on collision.
c. Momentum is conserved when two or more interacting objects push away from each other.
d. The total momentum of a system of interacting objects remains constant regardless of forces between the objects.

____ 12. A 65.0 kg ice skater standing on frictionless ice throws a 0.15 kg snowball horizontally at a speed of 32.0 m/s. At what velocity does the skater move backward?
a. 0.07 m/s
b. 0.30 m/s
c. 0.15 m/s
d. 1.20 m/s

____ 13. Each croquet ball in a set has a mass of 0.50 kg. The green ball travels at 10.5 m/s and strikes a stationary red ball. If the green ball stops moving, what is the final speed of the red ball after the collision?
a. 10.5 m/s
b. 6.0 m/s
c. 12.0 m/s
d. 9.6 m/s

____ 14. After colliding, objects are deformed and lose some kinetic energy. Identify the type of collision.
a. elastic
b. perfectly elastic
c. inelastic
d. perfectly inelastic

____ 15. Two balls of dough collide and stick together. Identify the type of collision.
a. elastic
b. perfectly elastic
c. inelastic
d. perfectly inelastic

____ 16. A clay ball with a mass of 0.35 kg has an initial speed of 4.2 m/s. It strikes a 3.5 kg clay ball at rest, and the two balls stick together and remain stationary. What is the decrease in kinetic energy of the 0.35 kg ball?
a. 1.6 J
b. 4.8 J
c. 3.1 J
d. 6.4 J

____ 17. A billiard ball collides with a stationary identical billiard ball in an elastic head-on collision. After the collision, which is true of the first ball?
a. It maintains its initial velocity.
b. It has one-half its initial velocity.
c. It comes to rest.
d. It moves in the opposite direction.

____ 18. Which of the following best describes the momenta of two bodies after a two-body collision if the kinetic energy of the system is conserved?
a. must be less
b. must also be conserved
c. might also be conserved
d. is doubled in value

____ 19. A 90 kg halfback runs north and is tackled by a 120 kg opponent running south at 4 m/s. The collision is perfectly inelastic. Just after the tackle, both players move at a velocity of 2 m/s north. Calculate the velocity of the 90 kg player just before the tackle.
a. 3 m/s south
b. 4 m/s south
c. 10 m/s north
d. 12 m/s north

____ 20. A 15 g marble moves to the right at 3.5 m/s and makes an elastic head-on collision with a 22 g marble. The final velocity of the 15 g marble is 5.4 m/s to the left, and the final velocity of the 22 g marble is 2.0 m/s to the right. What is the initial velocity of the 22 g marble?
a. 5.3 m/s to the left
b. 5.3 m/s to the right
c. 4.0 m/s to the left
d. 4.0 m/s to the right