Name _____ Class _____ Date _____

Assessment

Momentum and Collisions

Section Quiz: Momentum and Impulse

Write the letter of the correct answer in the space provided.

_____ **1.** What is the product of an object's mass and its velocity?
- **a.** kinetic energy
- **b.** momentum
- **c.** impulse
- **d.** inertia

_____ **2.** Which of the following has the greatest momentum?
- **a.** a 4.0 kg bowling ball moving at 2.0 m/s
- **b.** a 0.15 kg baseball moving at 10.0 m/s
- **c.** a 1.6×10^3 kg car moving at 0.5 m/s
- **d.** a 0.02 kg bullet moving at 950 m/s

_____ **3.** How does the momentum of an object change if the object's velocity doubles?
- **a.** The momentum doubles.
- **b.** The momentum increases by a factor of four.
- **c.** The momentum decreases by a factor of 1/2.
- **d.** The momentum decreases by a factor of 1/4.

_____ **4.** What are the units of momentum?
- **a.** N
- **b.** J
- **c.** kg•m/s
- **d.** kg•m/s^2

_____ **5.** Which of the following can determine the magnitude of the change in an object's momentum?
- **a.** mass and acceleration
- **b.** force and time interval
- **c.** force and distance
- **d.** acceleration and time interval

_____ **6.** Which of the following is true of changes in momentum?
- **a.** A small force may produce a large change in momentum by acting over a short time interval.
- **b.** A small force may produce a large change in momentum by acting over a long distance.
- **c.** A large force may produce a small change in momentum by acting over a short time interval.
- **d.** A small force may produce a large change in momentum by acting on a very massive object.

Momentum and Collisions *continued*

_____ **7.** If a net force acts on an object, then the object's momentum
- **a.** will increase.
- **b.** will decrease.
- **c.** will either increase or decrease.
- **d.** may or may not change.

_____ **8.** Which of the following involves a change in momentum?
- **a.** A bowling ball rolls down the lane at constant speed.
- **b.** A car coasts down a hill at constant speed.
- **c.** A sky diver descends with terminal velocity.
- **d.** A spacecraft travels at constant speed while slowly losing mass.

9. Define impulse, and state the impulse-momentum theorem.

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10. A 1.0×10^4 kg spacecraft is traveling through space with a speed of 1200 m/s relative to Earth. A thruster fires for 2.0 min, exerting a continuous force of 25 kN on the spacecraft in a direction opposite the spacecraft's motion. Calculate the initial momentum and the final momentum of the spacecraft.