/ 25

- 1. Define momentum. Give the equation and unit.
- 2. Two cars, one twice as heavy as the other, move down a hill at the same speed. Compared to that of the lighter car, the momentum of the heavier car is \_\_\_\_\_ as much.
- 3. a. For a constant force, if the duration of impact upon an object is doubled, how is the impulse affected?
  - b. How is the resulting change in momentum affected?
- 4. If the time of impact in a collision is extended by four times, by how much is the force of impact altered?

5. Define impulse. Give its equation and unit.

Use the impulse-momentum equation to answer questions 6-9:

- 6. Why is it important to "follow through" when trying to hit a home run?
- 7. Why does it hurt more when you fall on a concrete floor than on a wooden floor?
- 8. Why are car dashboards, steering wheels, and boxing gloves padded?
- 9. How can a karate "chop" break a board?
- 10. What is the momentum of a golf ball with a mass of 62 g moving at 73 m/s?
- 11. If in the problem above, the impact between the ball and club lasted for  $2.0 \times 10^{-3}$  s, what force acted on the ball? What force acted on the club?

12. For how long a time must a tow truck pull with a force of 550 N on a stalled 1200 kg car to give it a forward velocity of 2.0 m/s?