

2016-17 Momentum Quiz**Multiple Choice**

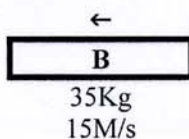
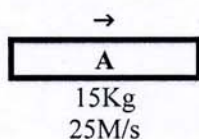
Identify the choice that best completes the statement or answers the question.

- ___ 1. A table tennis ball launcher is fired. Compared to the force on the ball, the force on the launcher is
- smaller.
 - the same.
 - larger.
- ___ 2. A 8.0-kg chunk of putty moving at 8.0 m/s collides with and sticks to a 7.0-kg bowling ball that is initially at rest. The bowling ball with its putty passenger will then be set in motion with a momentum of
- 16.0 kg·m/s.
 - more than 64.0 kg·m/s.
 - 0 kg·m/s.
 - 64.0 kg·m/s.
 - 1.0 kg·m/s.
- ___ 3. Suppose a girl is standing on a pond where there is no friction between her feet and the ice. In order to get off the ice, she can
- throw something in the direction opposite to the way she wants to go.
 - walk very slowly on tiptoe.
 - get on her hands and knees and crawl off the ice.
 - bend over touching the ice in front of her and then bring her feet to her hands.
 - all of the above will work
- ___ 4. Suppose a cannon is made of a strong but very light material. Suppose also that the cannonball is more massive than the cannon itself. For such a system
- conservation of energy would not hold.
 - conservation of momentum would not hold.
 - the target would be a safer place than where the operator is located.
 - the force on the cannonball would be greater than the force on the cannon.
 - recoil problems would be lessened.
- ___ 5. Compared to a sports car moving at 30 miles per hour, the same sports car moving at 60 miles per hour has
- four times as much momentum.
 - twice as much momentum.
 - the same momentum.
- ___ 6. When you jump off a step, you usually bend your knees as you reach the ground. By doing this, the time of the impact is about 10 times more what it would be in a stiff-legged landing, and the average force on your body is reduced by
- about 10 times.
 - more than 10 times.
 - less than 10 times.
- ___ 7. Two objects, A and B, have the same size and shape, but A is twice as heavy as B. When they are dropped simultaneously from a tower, they reach the ground at the same time, but A has a higher
- momentum.
 - speed.
 - acceleration.
 - all of the above
 - none of the above

- ___ 8. In order to catch a ball, a baseball player moves his or her hand backward in the direction of the ball's motion. Doing this reduces the force of impact on the player's hand principally because
- the momentum of impact is reduced.
 - the time of impact is decreased.
 - the time of impact is increased.
 - the velocity of the hand is reduced.
 - none of the above
- ___ 9. A freight train rolls along a track with considerable momentum. If it were to roll at the same speed but had twice as much mass, its momentum would be
- quadrupled.
 - doubled.
 - zero.
 - unchanged.
- ___ 10. A moving freight car runs into an identical car at rest on the track. The cars couple together. Compared to the velocity of the first car before the collision, the velocity of the combined cars after the collision is
- zero.
 - one half as large.
 - the same.
 - twice as large.
 - More information is needed to say.
- ___ 11. A small economy car (low mass) and a limousine (high mass) are pushed from rest across a parking lot, equal distances with equal forces. The car that receives the greater impulse is the
- limousine.
 - small economy car.
 - neither A nor B (same for each).
- ___ 12. Suppose an astronaut in outer space wishes to toss a ball against a very massive and perfectly elastic concrete wall and catch it as it bounces back. If the ball is as massive as the astronaut, then
- the astronaut will never catch the first bounce.
 - the astronaut's time between catches will decrease as the game progresses.
 - the astronaut will catch one bounce only.
 - none of the above
- ___ 13. Two gliders having the same mass and speed move toward each other on an air track and stick together. After the collision, the velocity of the gliders is
- the same as the original velocity.
 - one half the original velocity.
 - There is not enough information to say.
 - zero.
 - twice the original velocity.
- ___ 14. Momentum of a system is conserved only when
- there are no internal forces acting on the system.
 - there are no forces acting on the system.
 - the system is not moving.
 - the system has zero momentum.
 - there is no net external force acting on the system.

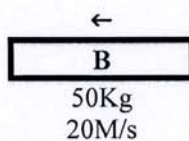
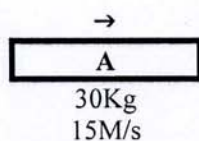
15. The reason padded dashboards are used in cars is that they
- decrease the impulse in a collision.
 - increase the force of impact in a collision.
 - look nice and feel good.
 - increase the time of impact in a collision.
 - decrease the momentum of a collision.

16. For the following elastic collision; What is the velocity and direction of "A" after the collision?



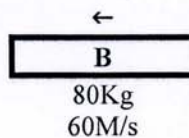
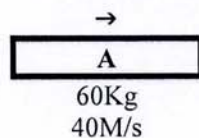
- 35.0 m/s to the Left
- 11 m/s to the Right
- 10.7 m/s to the Right
- 35.0 m/s to the Right
- 3.0 m/s to the Left

17. For the following elastic collision; What is the velocity and direction of "B" after the collision?



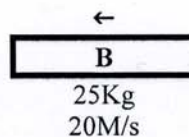
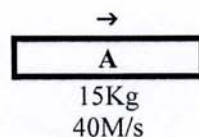
- 11.1 m/s to the Right
- 33.3 m/s to the Left
- 18.0 m/s to the Right
- 9.0 m/s to the Right
- 6.9 m/s to the Left

18. For the following elastic collision; What is the velocity and direction of "A" after the collision?



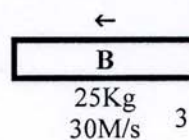
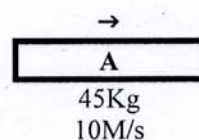
- 21.7 m/s to the Right
- 18.6 m/s to the Left
- 17.1 m/s to the Left
- 30.0 m/s to the Right
- 80 m/s to the Left

19. For the following inelastic collision; What is the velocity and direction of "B" after the collision?



- 24.0 m/s to the Right
- 7.2 m/s to the Right
- 2.5 m/s to the Right
- 11.3 m/s to the Right
- 33.3 m/s to the Left

20. For the following inelastic collision; What is the velocity and direction of "A" after the collision?



- 18.4 m/s to the Right
- 4.3 m/s to the Left
- 16.7 m/s to the Left
- 2.4 m/s to the Right
- 18.0 m/s to the Right

