Momentum Quiz Review – Concept Physics

1 Momentum of a system is conserved only when _____.

A there are no forces acting on the system.
B the system is not moving.
C there are no internal forces acting ont he system.
D there is no net external force acting on the system.

2 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 _____.

A bend over touching the ice in front of her, then bring here feet to her hands.
B walk very slowly on tiptoe.
C throw something in the opposite direction to that in which she wants to go.
D get on here hands and knees and crawl off the ice.

3 Compared to a sports car moving at 30 miles per hour, the same sports car moving at 60 miles per hour has _____.

A four times as much momentum
B two times as much momentum
C the same momentum
D half as much momentum

4 What two factors does momentum (p) depend on?

A mass and weight
B mass and velocity
C weight and velocity
D mass and acceleration

5 What type of collision occurs when two objects collide and stick together?

A completely elastic
B partially elastic and partially inelastic
C elastic
D inelastic

6 If two golf balls traveling at 2m/s collide, what will their velocity be after the collision?

A 0 m/s
B 1 m/s in the same opposite direction
C 2 m/s in the same direction they were traveling
D 2 m/s in the direction they came from

7 Which has more momentum, a 75,000 pound motor home traveling at 3 mph, or a 3,500 pound car traveling 70 mph?

A motorhome
B car
C both the same
D not enough information to tell

8 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.

A twice
B three times
C four times
D ten times

Short Answer

1 How does momentum effect car crashes? (Give two examples from the video that was watched in class)

2 In the event of car crashes why might it be important for policemen to know the basic concepts of momentum?

3 List two careers that need to know the basic concepts of momentum to help them deal with car crashes?

4 Describe the two types of collisions, elastic and inelastic.

5 Explain the theory of conservation of momentum and give the equation used to solve these problems.

6 Explain what impulse (force times time) had to do with the egg drop lab performed in class?

7 A 70 kg astronaut is space walking outside the capsule when the tether line breaks. As a means of returning to the capsule he throws his 2 kg space wrench at a speed of 14 m/s away from the capsule. At what speed does the astronaut move towards the capsule?

8 A 0.06 kg tennis ball, initially moving at a speed of 12 m/s, is struck by a racket causing it to rebound in the opposite direction at a speed of 18 m/s. What is the change of momentum of the ball?

9 A 0.06 kg tennis ball, initially moving at a speed of 12 m/s, is struck by a racket causing it to rebound in the opposite direction at a speed of 18 m/s. A high speed movie film determines that the racket and ball are in contact for 0.05 seconds. What is the average net force exerted on the ball by the racket?

10 A 92 kg fullback running 5 m/s, attempts to dive across the goal line for a touchdown. Just as he reaches the goal line, he is met head on in mid-air by a 88 kg linebacker, moving at 5.5 m/s. If they become entangled as one mass, with what velocity do they travel? Does the fullback score?

11 A 400 kg truck traveling at 18 m/s collides in an inelastic collision, where the vehicles stick together, with a 150 kg sports car traveling at 29 m/s. What is the final velocity of the two vehicles once they stick together.

12 A tennis ball (2 kg) traveling at 10 m/s collides with a 2^{nd} tennis ball (2 kg) that is sitting at rest. The collision is elastic with no energy lost. If the 1^{st} tennis ball comes to a stop after the collision what is the velocity of the 2^{nd} tennis ball?