McRoberts Secondary

Momentum Quiz 2025-10-23

Personal Data

Family Name:

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Registration Number

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In this section **no** changes or modifications must be made!

Scrambling 0 0

Type: 012

Exam ID(Physics 12): 25102300001

Please mark the boxes carefully: ☒ Not marked: ☐ or ■

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Only clearly marked and positionally accurate crosses will be processed!

Answers 1 - 12

	a	b	c	d
1	☐	☐		
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10	☐	☐	☐	☐
11	☐	☐	☐	☐
12	☐	☐	☐	☐
	a	b	c	d

1. True or false? Momentum is conserved in a completely inelastic collision.

    a. True
    b. False

2. True or false? Momentum is conserved when two objects collide and stick together.

    a. True
    b. False

3. True or false? Kinetic energy is conserved when two objects collide and stick together.

    a. True
    b. False

4. In a game of pool, the white cue ball hits the #2 ball and stops, while the #2 ball moves away with the same velocity as the cue ball had originally. Both balls have the same mass. The type of collision is

    a. elastic
    b. inelastic
    c. completely inelastic
    d. any of the above, depending on the mass of the balls

5. A rubber ball and a lump of putty have equal mass. They are both thrown with equal speed at a wall. The rubber ball bounces back with nearly the same speed with which it hit the wall. The putty sticks to the wall. Which object experiences the greater momentum change?

    a. The ball.
    b. The putty.
    c. Both experience the same momentum change.
    d. Cannot be determined from the information given.

6. What is the SI unit of impulse?

    a. N s
    b. kg m/s^2
    c. N m
    d. J s

7. A very light ball and a very heavy ball move in opposite directions toward each other with the same speed v. If the balls hit each other head on and the collision is elastic, then the speed of the lighter ball after the collision is approximately

    a. 0
    b. v
    c. $2v$
    d. $3v$

8. A ball of mass m rolls with speed v towards another ball of mass $(15/4)\mathrm{m}$ at rest. If the collision is completely inelastic, what is the speed of the combined mass after the collision?

    a. $(4/15)v$
    b. $(4/19)v$
    c. $(15/19)v$
    d. $(15/4)v$

9. A very light ball rolling with speed v collides with a very heavy ball at rest. If the collision is elastic, then the light ball's speed after the collision is approximately

    a. 0
    b. $v/2$
    c. v
    d. $2v$

10. A 120 g baseball is thrown towards a batter at 27 m/s. The batter hits the ball back along the same path, and at the same speed. If the bat was in contact with the ball for 1.4 ms, the average force exerted by the bat was

    a. 1.35×10^6 N
    b. 4630 N
    c. 3.51×10^6 N
    d. 4.63 N

11. Consider two balls of equal mass moving at different speeds. Ball 1 has double the kinetic energy of ball 2. How does the momentum of ball 1, p_1, compare to the momentum of ball 2, p_2?

    a. $p_1 = p_2$
    b. $p_1 = \sqrt{2}p_2$
    c. $p_1 = 2p_2$
    d. $p_1 = 4p_2$

12. A ball of mass 682 g, moving horizontally with speed 21 m/s strikes a wall and rebounds at 13 m/s. What is the magnitude of the change in momentum of the ball?

    a. 23 200 kg m/s
    b. 23.2 kg m/s
    c. 9.58 kg m/s
    d. 12 000 kg m/s