

Physics

Quiz: Torque and Moment of Inertia, Form: A

Name: _____

Date: _____

Period: _____

Peer Reviewer: _____

Authentication Code: _____

Section 1. Multiple Choice

Choose the best answer to each question.

+1	0	-1	Σ

1. A see-saw works best when the riders have the same -
 - (a) Mass
 - (b) Moment of Inertia
 - (c) Force of Gravity
 - (d) Torque
2. A basketball and a bowling ball are placed on a ramp. They are both released from rest and allowed to roll down the ramp. Which ball reaches the bottom of the ramp first?
 - (a) The bowling ball
 - (b) The basketball
 - (c) Both reach the bottom of the ramp at the same time.
 - (d) It cannot be determined without knowing the mass of each ball.
3. Which of the following is directly responsible for cans rolling at different speeds?
 - (a) they have different moments of inertia.
 - (b) They have different masses
 - (c) They have different radii.
 - (d) Their contents have different consistencies.
4. When attempting to tighten a screw, which would make it easiest to tighten a screw the same amount?
 - (a) A screwdriver with a large-radius handle.
 - (b) A screwdriver with a small-radius handle.
 - (c) They will both require the same amount of force.
 - (d) It is impossible to tell without knowing the length of the screwdriver.
5. You are driving on snow when you realize your rear wheels are skidding to the right. To maintain control of your vehicle, driving instructors suggest you should steer to the right in this situation. This is because -
 - (a) Steering to the right puts a torque on your vehicle that counters the rotation.
 - (b) Steering the right decreases the friction on your car, making it slide better.
 - (c) Steering to the right causes your car to have an angular acceleration that increases the rotation of the car.
 - (d) Driving instructors are wrong, and you should steer to the left.

Section 2. Multiple Correct Multiple Choice

Choose the best TWO answers to each question.

6. Torque can be calculated using which formulas? (CHOOSE TWO)
- (a) $\omega_f = \vec{\tau} \times \vec{\theta}$
 - (b) $\tau = I\alpha$
 - (c) $F = ma$
 - (d) $\tau = r \cdot F \cdot \cos(\theta)$
7. Which of the following would cause the torque acting on an object to be $0\text{ m} \times \text{N}$? (CHOOSE TWO)
- (a) The force is applied to anywhere other than the center of mass.
 - (b) The force is applied to the center of mass.
 - (c) The force is applied in a direction parallel to the radius.
 - (d) The object has a non-zero angular acceleration.
8. As you inflate a balloon, (CHOOSE TWO)
- (a) its moment of inertia decreases.
 - (b) its moment of inertia increases.
 - (c) any torques on the balloon increase.
 - (d) any torques on the balloon decrease.
9. Which of the following best describes moment of inertia? (CHOOSE TWO)
- (a) Resistance to angular acceleration
 - (b) The rotational equivalent of mass.
 - (c) A force that causes an object to rotate.
 - (d) Mass
10. Which of the following would be in rotational equilibrium? (CHOOSE TWO)
- (a) An object with no torques acting on it.
 - (b) An object with a net torque of 3 mN acting on it.
 - (c) An object rotating at a constant velocity (ω).
 - (d) An object experiencing a constant angular acceleration (α).

Answer Key for Exam A

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Choose the best answer to each question.

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