

In Motion Review #2

(Newton's Laws of Motion, Stopping and Braking Distance)

Part A – Multiple Choice

1. Which one of the following statements is true of an object that is at rest?
 - (A) There are no forces acting upon the object.
 - (B) There is no gravity acting upon the object.
 - (C) The individual forces acting upon the object are balanced.
 - (D) The individual forces acting upon the object are **NOT** balanced.

2. An object is moving to the left with a constant speed. What can be concluded about the forces acting upon the object?
 - (A) There is a leftward force but no rightward force.
 - (B) There are only vertical forces acting upon the object.
 - (C) There is a stronger leftward force than the rightward force.
 - (D) All the individual forces acting upon the object are balanced.

3. A net force acts upon an object. What can be known for certain to be true of the object?
 - (A) The object is stationary.
 - (B) The object is accelerating.
 - (C) The object is moving with a constant speed.

4. A 1000 kg car and a 5000 kg truck are both accelerating at the **same** rate. Which vehicle has the biggest force acting on it?
 - (A) The car.
 - (B) The truck.
 - (C) Neither. The force on both is the same.

5. The net force experienced by an object is decreased. The acceleration of the object
- (A) is increased.
 - (B) is decreased.
 - (C) is not affected by this change.
6. An object has an acceleration of 12.0 m/s^2 . The net force acting on the object is doubled while the mass of the object is held constant. What will be the new acceleration?
- (A) 2.0 m/s^2
 - (B) 6.0 m/s^2
 - (C) 14.0 m/s^2
 - (D) 24.0 m/s^2
7. A large truck traveling at 50 km/h collides with a Monarch butterfly that is crossing the road. How do the forces acting upon these two objects compare to one another?
- (A) The truck experiences the greater force.
 - (B) The butterfly experiences the greater force.
 - (C) The butterfly and the truck experience the same amount of force.
8. If you blow up a balloon, and then release it, the balloon will fly away. This is an illustration of
- (A) Newton's first law.
 - (B) Newton's second law.
 - (C) Newton's third law.
9. Which of the following will affect the total stopping distance of a car?
- (A) road conditions
 - (B) reaction time
 - (C) speed of the car
 - (D) all of the above

Part B – Free Response Questions

1. Your shopping cart has a mass of 65 kilograms. To accelerate the shopping cart down an aisle at 0.3 m/s^2 , what force would you need to use or apply to the cart?
2. A small child has a wagon with a mass of 10 kilograms. The child pulls on the wagon with a force of 2 N. What is the acceleration of the wagon?
3. Which of Newton's laws best explains why motorists should buckle-up?
4. A box is placed in the back of a truck. The box is not tied down. When the truck accelerates forward, the box moves towards the back of the truck. Explain why this happens referring to Newton's laws of motion.

