Acceleration Quiz Answer Key PDF

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Which of the following best describes uniform acceleration?

A. Acceleration that increases over time
B. Acceleration that decreases over time
C. Constant acceleration over time ✓
D. Zero acceleration

Which kinematic equation is used to calculate final velocity?

A. $v = u + at$ ✓
B. $s = ut + 1/2at^2$
C. $v^2 = u^2 + 2as$
D. $F = ma$

What is the SI unit of acceleration?

A. m/s
B. m/s^2 ✓
C. km/h
D. N/kg

If an object is moving with constant velocity, what is its acceleration?

A. Positive
B. Negative
C. Zero ✓
D. Infinite

How can you determine the acceleration of an object using a velocity-time graph?

To determine the acceleration of an object using a velocity-time graph, calculate the slope of the line on the graph. The slope represents the change in velocity over time, which is the definition of acceleration.

Describe a real-world scenario where non-uniform acceleration occurs and explain why.

A real-world scenario of non-uniform acceleration is a car navigating a hilly and curvy road. The car accelerates and decelerates at different rates as it goes up and down hills and turns, resulting in varying acceleration.

What is the significance of centripetal acceleration in circular motion? Provide an example.

Centripetal acceleration is the acceleration directed towards the center of a circular path that keeps an object in circular motion. An example is a satellite orbit around Earth, where gravitational force acts as the centripetal force.

Which of the following is an example of centripetal acceleration?

A. A car speeding up on a straight road
B. A ball thrown upwards
C. A satellite orbitin Earth ✓
D. A falling leaf

What is the acceleration due to gravity on Earth approximately equal to?

A. 9.81 m/s² ✓
B. 8.91 m/s²
C. 10.81 m/s²
D. 7.81 m/s²

Which of the following are kinematic equations? (Select all that apply)

A. $v = u + at$ ✓
B. $s = ut + 1/2at^2$ ✓
C. $F = ma$
D. $v^2 = u^2 + 2as$ ✓

Which of the following scenarios involve acceleration? (Select all that apply)

A. A car coming to a stop ✓
B. A cyclist maintaining a constant speed
C. A ball being thrown upwards ✓
D. A book resting on a table

Which of the following factors affect acceleration? (Select all that apply)

A. Mass ✓
B. Force ✓
C. Velocity
D. Time

Discuss the importance of understanding acceleration in vehicle safety design.

Acceleration plays a vital role in vehicle safety design by informing the development of safety features that protect occupants during sudden stops or collisions.

What are the characteristics of non-uniform acceleration? (Select all that apply)

A. Constant speed
B. Changing acceleration ✓
C. Varyin velocity ✓
D. Constant direction

What can be determined from a position-time graph? (Select all that apply)

A. Speed ✓
B. Displacement ✓
C. Acceleration ✓
D. Force

Explain how acceleration is related to Newton's Second Law of Motion.

Acceleration is related to Newton's Second Law of Motion through the equation F=ma, where F is the net force applied to an object, m is its mass, and a is the acceleration produced.

In the equation F = ma, what does m represent?

A. Momentum

B. Mass ✓

C. Force

D. Acceleration

In which situations is understanding acceleration crucial? (Select all that apply)

A. Designin roller coasters ✓

B. Developin sports strategies ✓

C. Bakina cake

D. Planning car safety features ✓

What does the slope of a velocity-time graph represent?

A. Displacement

B. Speed

C. Acceleration ✓

D. Time

How do kinematic equations help in solving problems involving motion? Provide an example of their application.

Kinematic equations help in solving problems involving motion by providing a set of formulas that relate displacement, initial velocity, final velocity, acceleration, and time. For example, if a car accelerates from rest at a rate of 2 m/s² for 5 seconds, the kinematic equation \(s = ut + \frac{1}{2}at^2\) can be used to find the distance traveled, which would be \(s = 0 + \frac{1}{2}(2)(5^2) = 25\) meters.