Quiz #1: Newton’s 1st Law and Linear Motion

Question 1 (2 points)
Whirl a rock at the end of a string on an ice-covered pond and it follows a circular path. If the string breaks, the tendency of the rock is to

a) continue to follow a circular path
B) follow a straight-line path → Once the net force is zero, the rock moves in a straight line at a constant speed

Question 2 (2 points)
When a rock thrown straight upwards gets to the exact top of its path, its

a) velocity is zero and its acceleration is zero
B) velocity is zero and its acceleration is about 10 m/s² → If the acceleration was zero, the ball would hover

c) velocity is about 10 m/s and its acceleration is zero
d) velocity is about 10 m/s and its acceleration is about 10 m/s²
e) none of these

Question 3 (2 points)
As an object falls in the absence of air resistance, its

A speed increases → Without air resistance, all objects accelerate at 10 m/s²
b) acceleration increases
c) both of these
d) none of these

Question 4 (2 points)
Push a cart and it moves. When you stop pushing, it comes to rest. Does this violate Newton’s 1st law? Explain your answer.

This does not violate Newton’s 1st law. The cart does not continue moving at a constant velocity because friction and air resistance act on the cart to bring it to rest.

Question 5 (2 points)
Can an object be accelerating while moving at a constant velocity? If so, give an example. If not, explain why.

An object can not be accelerating while traveling at a constant velocity. If the velocity is constant, the acceleration is zero.

Can an object be moving when its acceleration is zero? If so, give an example. If not, explain why.

Yes, an object can be moving when its acceleration is zero.

A car driving in a straight line at a constant speed has an acceleration of zero.