ANSWERS TO EVEN NUMBERED CONCEPTUAL QUESTIONS

2. Yes. Zero velocity means that the object is at rest. If the object also has zero acceleration, the velocity is not changing and the object will continue to be at rest.

4. No. They can be used only when the acceleration is constant. Yes. Zero is a constant.

6. (a) In Figure (c,) the images are farther apart for each successive time interval. The object is moving toward the right and speeding up. This means that the acceleration is positive in (c).

(b) In Figure (a), the first four images show an increasing distance traveled each time interval and therefore a positive acceleration. However, after the fourth image, the spacing is decreasing showing that the object is now slowing down (or has negative acceleration).

(c) In Figure (b), the images are equally spaced showing that the object moved the same distance in each time interval. Hence, the velocity is constant in (b).

8. (a) At the maximum height, the ball is momentarily at rest. (That is, it has zero velocity.) The acceleration remains constant, with magnitude equal to the free-fall acceleration g and directed downward. Thus, even though the velocity is momentarily zero, it continues to change, and the ball will begin to gain speed in the downward direction.

(b) The acceleration of the ball remains constant in magnitude and direction throughout the ball's free flight, from the instant it leaves the hand until the instant just before it strikes the ground. The acceleration is directed downward and has a magnitude equal to the free-fall acceleration g.

10. (a) Successive images on the film will be separated by a constant distance if the ball has constant velocity.

(b) Starting at the right-most image, the images will be getting closer together as one moves toward the left.

(c) Starting at the right-most image, the images will be getting farther apart as one moves toward the left.

(d) As one moves from left to right, the balls will first get farther apart in each successive image, then closer together when the ball begins to slow down.