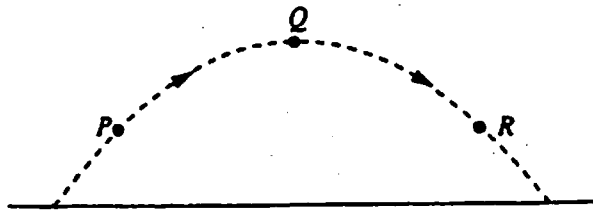


Kinematics

(PS.2)



Questions 6-8

A ball is thrown and follows the parabolic path shown above. Air friction is negligible. Point Q is the highest point on the path. Points P and R are the same height above the ground.

6) How do the speeds of the ball at the three points compare?

- (A) $v_P < v_Q < v_R$
- (B) $v_R < v_Q < v_P$
- (C) $v_Q < v_R < v_P$
- (D) $v_Q < v_P = v_R$
- (E) $v_P = v_R < v_Q$

7)

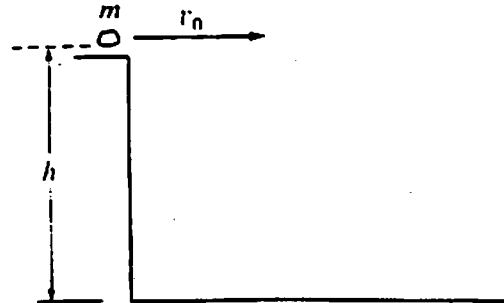
Which of the following best indicates the direction of the net force, if any, on the ball at point Q ?

- (A)
- (B)
- (C)
- (D)

(E) There is no net force on the ball at point Q .

8) Which of the following diagrams best shows the direction of the acceleration of the ball at point P ?

- (A)
- (B)
- (C)
- (D)
- (E)

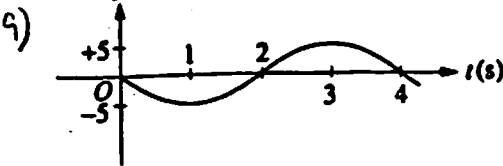


10)

A rock of mass m is thrown horizontally off a building from a height h , as shown above. The speed of the rock as it leaves the thrower's hand at the edge of the building is v_0 .

1. How much time does it take the rock to travel from the edge of the building to the ground?

- (A) $\sqrt{h v_0}$
- (B) h/v_0
- (C) $h v_0/g$
- (D) $2h/g$
- (E) $\sqrt{2h/g}$



A particle oscillates up and down in simple harmonic motion. Its height y as a function of time t is shown in the diagram above. At what time t does the particle achieve its maximum positive acceleration?

- (A) 1 s
- (B) 2 s
- (C) 3 s
- (D) 4 s
- (E) None of the above, because the acceleration is constant

Kinematics (pg. 1)

1) An object is released from rest on a planet that has no atmosphere. The object falls freely for 3.0 meters in the first second. What is the magnitude of the acceleration due to gravity on the planet?

- (A) 1.5 m/s^2
- (B) 3.0 m/s^2
- (C) 6.0 m/s^2
- (D) 10.0 m/s^2
- (E) 12.0 m/s^2

2) In which of the following situations would an object be accelerated?

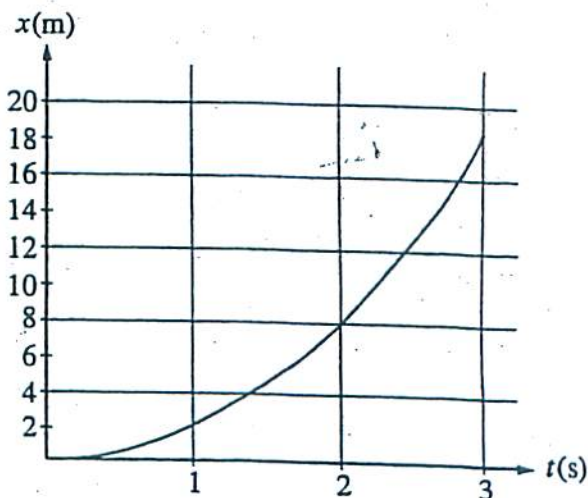
- I. It moves in a straight line at constant speed.
- II. It moves with uniform circular motion.
- III. It travels as a projectile in a gravitational field with negligible air resistance.

- (A) I only
- (B) III only
- (C) I and II only
- (D) II and III only
- (E) i. II. and III

3) For which of the following motions of an object must the acceleration always be zero?

- I. Any motion in a straight line
- II. Simple harmonic motion
- III. Any motion in a circle

- (A) I only
- (B) II only
- (C) III only
- (D) Either I or III, but not II
- (E) None of these motions guarantees zero acceleration.



4) The graph above represents position x versus time t for an object being acted on by a constant force. The average speed during the interval between 1 s and 2 s is most nearly

- (A) 2 m/s
- (B) 4 m/s
- (C) 5 m/s
- (D) 6 m/s
- (E) 8 m/s

5) A ball is thrown straight up in the air. When the ball reaches its highest point, which of the following is true?

- (A) It is in equilibrium.
- (B) It has zero acceleration.
- (C) It has maximum momentum.
- (D) It has maximum kinetic energy.
- (E) None of the above