

Id No: _____

Part I Choice (1.5 pts. each)

- ____ 1. Which of the following situation is impossible?
- A. An object has velocity directed east and acceleration directed west.
 - B. An object has velocity directed east and acceleration directed east.
 - C. An object has Zero acceleration, then the object is not in motion.
 - D. An object has constant none zero acceleration and changing velocity.
- ____ 2. An object moving in the +x direction experiences an acceleration of $+2\text{m/s}^2$. This means the object
- A. travels 2m in every second.
 - B. is traveling at 2m/s.
 - C. is decreasing its velocity by 2m/s every second.
 - D. is increasing its velocity by 2m/s every second.
- ____ 3. A student throws a red ball horizontally from a balcony of a tall building with an initial speed u and at the same time another student drops a blue ball vertically from the same balcony. Neglecting air resistance, which statement is true?
- A. The blue ball reaches the ground first.
 - B. The balls reach the ground at the same time.
 - C. The red ball reaches the ground first.
 - D. Both balls hit the ground with the same speed.
- ____ 4. A car travels 6 km due east and then 4 km in a direction 60° north of east. Find the magnitude and direction of the car's displacement vector.
- A. 8.72 km 23.41° north east
 - B. 8.72 km 66.59° north east
 - C. 5.29 km 23.41° north east
 - D. 5.29 km 66.59° north east
- ____ 5. If $x = 0.72 + 0.8 + 3.87 - 1.089$ then the number of significant digit in the value x is
- A. 2
 - B. 3
 - C. 1
 - D. 4
- ____ 6. A projectile moves in its parabolic path, at what point the velocity and acceleration vectors are perpendicular to each other?
- A. everywhere along the projectile's path
 - B. at the maximum height of its path
 - C. nowhere along its path
 - D. at initial point of the projectile
- ____ 7. A boy throws a ball vertically upward with an initial speed of 20m/s. Neglecting air resistance, which of the following is true about the motion of the ball?
- A. Its velocity after 3s is 50m/s downward.
 - B. The time taken to reach the maximum height is 4s.
 - C. Its velocity after 1s is 30m/s, upward.
 - D. Its maximum height is 20m.
- ____ 8. A car travels a distance of 2 km along a straight line. It covers a distance of 0.5 km at a uniform speed of 10m/s. With what uniform speed it should travel the remaining distance so that the average speed for the entire journey is 15 m/s?
- A) 12 m/s
 - B) 20 m/s
 - C) 24 m/s
 - D) 30 m/s

Part II Short answer

1. Discuss the difference between random error and systematic error. (3 pts.)
2. What is the difference between
 - A. Free fall motion and projectile motion (1.5 pts.)
 - B. Fundamental and Derived physical quantities (give example) (1.5 pts.)
3. State the rules for determining significant digits (3 pts.)

Part III Workout

1. Vector A has x and y components of -8.70 cm and 15.0 cm, respectively; vector B has x and y components of 13.2 cm and - 6.60 cm, respectively. If $A - B + 3C = 0$, find (2 pts.)
 - a) The components of C
 - b) The unit vector in the direction of vector C.
2. A particle initially located at $\mathbf{r}_i = (10\mathbf{i} - 4\mathbf{j})$ m has an acceleration of $\mathbf{a} = (0.8\mathbf{i} - 0.3\mathbf{j})$ m/s² and an initial velocity of $\mathbf{v}_i = (4\mathbf{i} + \mathbf{j})$ m/s. Find the coordinates and speed of the particle at $t = 2$ s. (3 pts.)
3. A projectile is fired with a speed v_0 that makes an angle θ_0 above the horizontal. Find the horizontal position X when the projectile is at a vertical position $y = h$, see Fig. 1. (4 pts.)

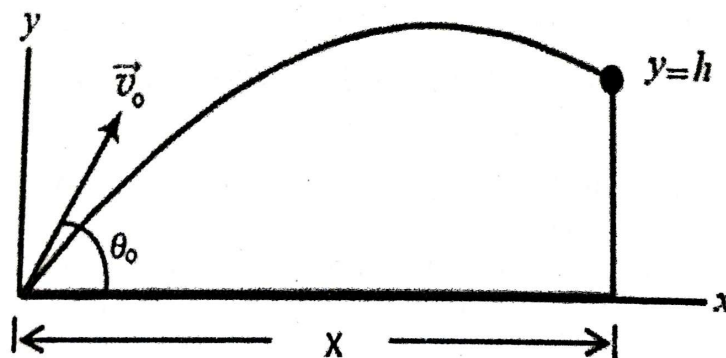


Fig. 1