

SNC2D: Exam Review Questions: MOTION

True/False

Indicate whether each statement is true or false.

Correct each *false* statement by changing the **bold** part.

- T / F 1. **Scalar** quantities have both a magnitude and a direction.
- T / F 2. Velocity and speed can have the same **units**.
- T / F 3. **Acceleration** can be determined by finding the *slope* of a position-time graph.
- T / F 4. If an object's motion is uniform, its average velocity and its **instantaneous velocity** are equal.
- T / F 5. If a journey takes you back to your starting point, your displacement and the distance you traveled **equal zero**.

Completion

6. An object's speed doesn't change if the acceleration is _____.
7. The area under the graphed line in a _____ graph is the distance traveled.

Multiple Choice

Circle the letter of the best answer for each of the following questions.

8. If a **distance-time graph** has zero slope, you can infer that the object being observed was
- (a) moving at constant speed
 - (b) moving to the right and accelerating
 - (c) moving uniformly to the left
 - (d) moving to the left and accelerating
 - (e) not moving at all
9. Which quantity cannot be calculated from a **speed-time graph**?
- (a) the object's initial position
 - (b) the direction of the object's motion
 - (c) how fast the object is moving
 - (d) whether the object is accelerating
 - (e) the distance traveled by the object.
10. Suppose that you are studying cars travelling across an intersection. You decide to measure each car's initial speed, final speed, and time taken to cross the intersection. Which quantity below could you calculate from this data?
- (a) distance traveled
 - (b) average acceleration
 - (c) none of the above

Short Answer

11. Classify each quantity listed below as a **vector** or a **scalar**.

- (a) mass (b) speed (c) time (d) velocity (e) position (f) acceleration

12. How many **significant digits** are in each measurement below?

- (a) 4.00 cm (b) 0.0063 s (c) 104 kg (d) 4.60×10^{-3}

13. Which of the following situations are examples of **uniform motion**, and which are examples of **accelerated motion**?

- (a) a runner poised at the starting line
(b) the runner speeding up just after the starting pistol is fired.
(c) the runner travelling at a steady speed around a corner
(d) the runner slowing down after passing the finish line

14. The worst recorded elevator disaster occurred in South Africa, when a mine elevator dropped 487 m in 9.7 s before hitting the bottom of the mine shaft. How **fast** would the elevator be traveling at the end of the fall?

Assume an initial velocity of 0 m/s and the acceleration due to gravity is 9.8 m/s².

15. High-speed passenger elevators move upward at speeds of up to 7.1 m/s. At this rate, how **long** would an elevator take to climb 37 m (about ten stories)?

16. A motorcycle at a stop sign accelerated uniformly for 4.5 s, and reached 100.0 km/h.

- a) convert 100.0 km/h into m/s
b) determine the motorcycle's **acceleration**.

17. A barrel rolls down a road at a constant speed, rolls over a rough patch, and then rolls down a hill until it hits a wall and stops.

- (a) Draw a speed-time graph of the barrel's motion.
(b) Draw a distance-time graph of the barrel's motion.

18. What is the **displacement** of a person who starts at a position of 2.8 km [N of X], walks 5.0 km [E], then goes 7.4.0 km [S] ?

19. What is the **displacement** of an airplane which maintains a constant velocity of 200 km/h [W] for 45 minutes ?

20. Plot the following **distance-time** data as two graphs:

#1	time (s)	distance (m)	#2	time (s)	distance (m)
	0.0	0.0		0.0	20.0
	10.0	15.0		10.0	12.0
	20.0	30.0		20.0	8.0
	30.0	45.0		30.0	8.0
	40.0	60.0		40.0	12.0
	50.0	75.0		50.0	20.0
	60.0	90.0		60.0	32.0

- (a) Which one of the graphs represents an object traveling at **constant speed**?
- (b) Use **slope** to determine the **speed** for graph #1 .
- (c) What is the **average speed** for the object in graph #2 between 15 s and 45 s seconds?
- (d) What is the **instantaneous speed** of the object in graph #2 at 10. s?