Motion: Chapter Introduction

Sitting still? With the Earth you are moving at about 1,500 km/h. Motion is a change of position with time, measured from a reference point, and this chapter gives the tools to describe it.

Name: Date: Score: ____ / 17

A. Fill in the blanks

1. Motion is a change of ____ with time.

2. Motion is always described relative to a ____ point.

3. On a distance-time graph, a flat line means the object is at ____.

4. A steeper distance-time graph means the object is moving ____.

B. True or False

5. A chair is at rest for you but moving for an observer on the Sun. True / False

6. Speed and velocity mean exactly the same thing. True / False

7. A distance-time graph can tell us whether an object is moving. True / False

8. Acceleration tells how fast an object is. True / False

C. Assertion and reason

9. Assertion (A): Motion is relative.
Reason (R): The same object can be at rest for one observer and moving for another.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

10. Assertion (A): A flat distance-time graph shows uniform motion.
Reason (R): On a flat graph the distance does not change with time.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

D. Choose the correct option

11. Motion is:

(a) change of mass
(b) change of position with time
(c) change of colour
(d) change of shape

Answer: _____

12. Which quantity describes how fast velocity changes?

(a) distance
(b) speed
(c) acceleration
(d) displacement

Answer: _____

13. On a distance-time graph, which line shows the fastest motion?

(a) flat
(b) gentle slope
(c) steep slope
(d) falling to zero

Answer: _____

14. Which is NOT a tool of this chapter?

(a) displacement
(b) velocity
(c) acceleration
(d) density

Answer: _____

E. Short answer questions

15. Why do we need a reference point to describe motion?

16. Name the main quantities this chapter uses and what each tells us.

F. Match the columns

17. Match each item in Column A with the correct item in Column B.

Column A	Column B	Your answer
1. Change of position with time	(a) At rest	1 → ____
2. Flat distance-time graph	(b) Acceleration	2 → ____
3. Rate of change of velocity	(c) Reference point	3 → ____
4. Point we measure from	(d) Motion	4 → ____

Detailed solutions

1. position

2. reference

3. rest

4. faster

5. True. Rest and motion depend on the reference point.

6. False. Velocity also has a direction; speed does not.

7. True. A changing distance shows motion; a flat line shows rest.

8. False. It tells how fast the velocity changes.

9. (a) R is the meaning of relative motion.

10. (d) A is false: flat means rest. R is true.

11. (b) change of position with time. By definition.

12. (c) acceleration. Acceleration is the rate of change of velocity.

13. (c) steep slope. Steeper slope = more distance per second.

14. (d) density. Density belongs to matter, not motion.

15. Position is measured from some point. The same object can be still for one observer and moving for another, so motion is meaningless without stating the reference.

16. Distance/displacement: how far and in which direction. Speed/velocity: how fast (velocity with direction). Acceleration: how quickly velocity changes. Graphs: show all these at a glance.

17. 1 → (d), 2 → (a), 3 → (b), 4 → (c). These are the chapter's basic definitions.