

# M.L. Syal's Helix Institute

S.C.O. 343-345, Top Floor, Sector 34-A, Chandigarh. Ph : 0172-2623155

## Motion (Part-1)

### True/False questions

Mark the statement whether it is true or false. If the statement is false, write the true statement.

1. A body is said to be at rest if it does not change its position with respect to the reference point.
2. Velocity and speed are measured in different units.
3. In one dimensional motion the average velocity and the instantaneous velocity are always equal.
4. A motion is said to be uniform if a body undergoes equal displacements in equal intervals of time, however small these intervals might be.
5. Acceleration is defined as the rate of change of speed.

### Fill in the blanks

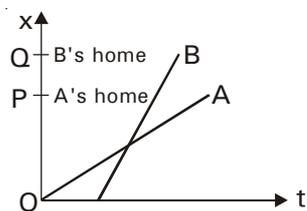
1. A body is said to be in motion if it change its ..... with respect to the surroundings.
2. The reference point from which the distance of a body is measured is called .....
3. Distance is the length of ..... path followed by the body between initial and final positions.
4. Displacement is the ..... distance between initial and final positions of a body.
5. Speed is the ratio of the ..... travelled to the time taken.
6. A point object is one whose size is ..... as compared to the distance it moves.
7. A body is said to be at rest if it does not change its ..... with respect to the surroundings.

### Objective type questions

In the following questions, four options are given out of which only one is correct.

1. A particle is moving in space. If displacement of the particle becomes zero at some instant, the distance covered at this instant
  - (1) must be zero
  - (2) may be zero
  - (3) cannot be zero
  - (4) may be negative
2. For a particle, the distance covered is known to be zero. Then, its displacement
  - (1) must be zero
  - (2) may or may not be zero
  - (3) cannot be zero
  - (4) may be negative
3. The ratio of magnitude of displacement of a moving body to the distance covered by it is
  - (1) less than one
  - (2) equal to one
  - (3) more than one
  - (4) equal to or less than one
4. A boy moves 30 m towards east and then 40 m towards south. Displacement of the boy in this trip and the distance covered by him are respectively
  - (1) 70 m and 70 m
  - (2) 50 m and 70 m
  - (3) 70 m and 50 m
  - (4) 10 m and 70 m
5. The position of a particle along x-axis at time t is given by,  $x = 4 + 2t + 4t^2$ , where x is in metre and t in second. Displacement of the particle in first 2 seconds is
  - (1) 10 m
  - (2) 14 m
  - (3) 20 m
  - (4) 16 m
6. A man goes 100 m towards north, then 60 m towards east and finally 20 m towards south. Then he is at a distance ..... from the starting point.
  - (1) 100 m
  - (2) 180 m
  - (3) 140 m
  - (4) 0 m
7. Rate of change of displacement of a moving body is equal to its
  - (1) speed
  - (2) velocity
  - (3) acceleration
  - (4) retardation
8. Sohan completes one round of a circular track of radius 50 m in 1 minute. His displacement at the end of 2 min 30 seconds is
  - (1) 50 m
  - (2) 125 m
  - (3) 75 m
  - (4) 100 m
9. Let 'v' denote the velocity and 'a' denote acceleration of a moving body. Then
  - (1) a can be non-zero when  $v = 0$
  - (2) a must be zero when  $v = 0$
  - (3) a must be non-zero when  $v \neq 0$
  - (4) a must be zero when  $v \neq 0$

10. A body covers three quarters of a circle of radius 'r'. Ratio of the distance covered by it to the magnitude of its displacement is
- (1)  $\frac{3\pi}{2\sqrt{2}}$                       (2)  $\frac{3\pi}{\sqrt{2}}$
- (3)  $\frac{\pi}{\sqrt{2}}$                               (4)  $\frac{3\pi}{2}$
11. Which of the following statements is true for a particle moving with uniform velocity?
- (1) Its speed is zero  
(2) Its speed may be variable  
(3) Its acceleration is opposite to the velocity  
(4) Its acceleration is zero
12. Distance covered in a given interval of time by a body will be equal to the magnitude of its displacement if it moves
- (1) with constant velocity  
(2) with constant acceleration  
(3) with constant speed  
(4) in the same direction
13. Speedometer of a car measures
- (1) distance covered  
(2) acceleration  
(3) instantaneous speed  
(4) average speed
14. A car is moving at 72 km/hr. How much distance will it cover in 15 minutes?
- (1) 36 km                              (2) 9 km  
(3) 18 km                              (4) 72 km
15. A goods train is moving with a uniform velocity of 54 km/h. Time taken by the train to cross a signal pole near the track, if its length is 225 m, will be
- (1) 10 seconds                      (2) 15 seconds  
(3) 12 seconds                      (4) 18 seconds
16. A train 100 m long is moving with a speed of 108 km/hr. Time taken by it to cross a bridge 800 m long is
- (1) 26.7 seconds                      (2) 60 seconds  
(3) 52.2 seconds                      (4) 30 seconds
17. A particle starts from the origin goes along x-axis to point (20 m, 0) and then returns along the same line to the point (-20 m, 0). The displacement and distance of the particle during the trip are
- (1) -20 m, 60 m                      (2) 20 m, 40 m  
(3) 0, 40 m                              (4) -20 m, 40 m
18. If a body covers equal displacements in equal intervals of time, however small these intervals may be, its motion is
- (1) uniform                              (2) non-uniform  
(3) circular                              (4) accelerated
19. If the distance travelled by an object is directly proportional to the length of time elapsed, then the object has
- (1) uniform velocity  
(2) zero velocity  
(3) constant speed  
(4) constant acceleration
20. Which of the following can not be zero, when a particle is in motion for some time?
- (1) Distance  
(2) Displacement  
(3) Average speed  
(4) Both (1) and (3)
21. Figure shows the position-time (x-t) graph of motion of two boys A and B respectively from school O to their homes P and Q respectively. Which of the following statements is true?



- (1) A walks faster than B  
(2) both A and B reach home at same time  
(3) B starts from home earlier than A  
(4) B overtakes A on his way to home

### Answers

True/False (T/F)		Fill in the blanks		Objective Questions	
(1)	True	1.	Position	1.	(3)
(2)	False	2.	Origin	2.	(1)
(3)	False	3.	Actual	3.	(4)
(4)	True	4.	Shortest	4.	(2)
(5)	False	5.	Distance	5.	(3)
		6.	Small	6.	(1)
		7.	Position	7.	(2)
				8.	(4)
				9.	(1)
				10.	(1)
				11.	(4)
				12.	(1)
				13.	(3)
				14.	(3)
				15.	(2)
				16.	(4)
				17.	(1)
				18.	(1)
				19.	(3)
				20.	(4)
				21.	(4)