1. An object has moved through a distance. Can it have zero displacement? If yes, support your answer with an example. What does the odometer of an automobile measure?
2. Which of the following is true for displacement? (a) it cannot be zero. (b) its magnitude is greater than the displacement travelled by the object.
3. What does the path of an object look like when it is in uniform motion?
4. An object travels 16 m in 4 s and the other 16 m in 2 s. What is the average speed of the object?
5. Distinguish between (a) speed and velocity (b) distance and displacement.
6. Under what conditions is magnitude of average velocity of an object equal to its average speed?
7. During an experiment, a signal from a spaceship reached the ground station in five minutes. What was the distance of the spaceship from the ground station? The signal travels at the speed of light, that is $3 \times 10^8 \ ms^{-1}$. Define uniform motion and acceleration.
8. The odometer of a car reads 2000 km at the start of a trip and 2400 km at the end of the trip. If the trip took 8 h, calculate the average speed of the car in km/h and m/s.
9. A woman travels a distance of 1 m towards north then 2 m towards east and finally 3 m towards south. Find: (a) the total distance (b) displacement.
10. Give three examples where distance is not equal to the magnitude of displacement.
11. A square track of edge length 100 m, an athlete starts from one corner and reaches diagonally opposite corner. Find the distance and magnitude of displacement of the athlete.
12. A cricket ball is thrown up. It reaches a height of 10 m from the point of throw and then reaches back to the point of throw. Find the distance and displacement of the ball.
13. A car is moving with a speed of 30 m/s. Find the distance covered by the car in 1 minute.
14. A body travels a distance of 10 km with a constant speed of 30 km/h and then the next 40 km at a constant speed of 50 km/h. Find the average speed for the whole journey.
15. An odometer of a car reads 2000 km at the start of a trip and 2400 km at the end of the trip. If the trip took 8 h, calculate the average speed of the car in km/h and m/s.
16. A 100 m long train crosses a bridge of length 200 m in 50 seconds with constant velocity. Find the velocity.
17. What does the slope of v-t graph indicate? What does the area under v-t graph indicate?
18. Velocity-time graph of a body is parallel to time axis. What is the acceleration of the body?
19. Derive the equations of motion. What does the slope of distance-time graph indicate?
20. A car accelerates uniformly from 10 km/h to 36 km/h in 5 sec. Calculate the acceleration and the distance covered by the car in that time.
21. A car moving along a straight line at a speed of 72 km/h stops in 5 sec after the brakes are applied. Find the acceleration and plot the graph of speed versus time.
22. An object is moving with a velocity of 6 m/s and with an acceleration of -1 m/s^2. What will be the distance travelled by the car and time taken for coming to rest.
23. A car moves a circular path of radius 20 m in 50 s with a uniform speed. Find the speed.
24. The two objects move in circular path of radii in the ratio of 1: 3 and take same time to complete the circle, what is the ratio of their speed?
25. Draw a velocity – time graph of a stone thrown vertically upwards and then coming downwards after attaining the maximum height.
26. Explain why a glass pane of a window is shattered when a flying pebble hit it?
27. What happens when you shake a wet piece of cloth? Explain your observation.
28. A man falling on a cemented floor receives more injuries than a man falling on a sandy floor. Why?
29. Which has more inertia, a bicycle or a train and why? Define 1 kg weight and express it in Newton.
30. Why do passengers tend to fall backwards when it starts suddenly?
31. Name the physical quantity which is determined by the rate f change of linear momentum.

32. What is the mass of an object whose weight is 196 N?
33. Which has greater inertia: a stone of mass 1 kg or a stone of mass 5 kg.
34. A bullet of mass 25 g is fired horizontally with a velocity of 100 m/s from a gun of mass 5 kg. calculate the recoil velocity of the gun.
35. State Newton's third law of motion. In a collision's between heavier body and a lighter body, how do the forces experienced by the two bodies compare?
36. Which has higher value of momentum? A bullet of mass 10 g moving with a velocity of 400 m/s or a cricket ball of mass 400 g thrown with a speed of 90 km/h.
37. A hammer of mass 500 g, moving at 50 m/s strikes a nail. The nail stops the hammer in a very short time of 0.015. What is the force of the nail on the hammer?
38. It is dangerous to jump out of a moving bus. Explain why?
39. A man pushes a box of mass 50 kg with a force of 80 N. What will be the acceleration of the box due to this force? What would be the acceleration if the mass is doubled?
40. Two balls A and B of masses m and 2m are in motion with velocities 2v and v respectively compare their force needed to stop them in the same time.
41. State Newton's second law of motion. Write its mathematical expression. How can you state first law from it?
42. Name the factors on which momentum of a body depends.
43. What is the relation between force and acceleration? Name the principle on which a rocket works.
44. When a person jumps out of a boat, the boat moves backwards. Explain why?
45. When two bodies X and Y collide with each other, X exerts a force of 5 N on Y towards east direction. What is the force exerted by Y on X? justify your answer stating the law.
46. Why don't the forces of action and reaction cancel each other?
47. A ball of mass 100 g moving with a velocity of 10 m/s is stopped by a boy in 0.25. Calculate the force applied by the boy to stop the ball.
48. A constant force acts on an object mass 5 kg for a duration of 2 s. It increases the object's velocity from 3 m/s to 7 m/s. Find the magnitude of the force applied. Now if the force were applied for a duration of 5 s, what would be the final velocity of the object?
49. What is motion? Define its types. What do you mean by uniform motion? Give an example.
50. What is meant by non-uniform motion? Give an example. What is distance? Is it a scalar or vector quantity?
51. Define displacement. Is it always positive? What is the SI unit of speed? What is acceleration?
52. How can you calculate the average speed of a body? What is instantaneous speed? How is it different from average speed? Write the equations of motion for uniformly accelerated motion.
53. A body is moving with a velocity of 20 m/s. It decelerates at the rate of 4 m/s². How much time will it take to stop? What is the significance of the area under the velocity-time graph?
54. A body accelerates uniformly from rest to 20 m/s in 10 seconds. Find the acceleration.
55. What is the relationship between displacement, velocity, and time in uniformly accelerated motion?
56. What is inertia? Give examples. State Newton's Second Law of Motion.
57. State Newton's Third Law of Motion. Give an example. What do you mean by momentum? What is its SI unit?
58. A bullet of mass 50 g is fired with a velocity of 100 m/s. What is its momentum?
59. What happens when a body moves with a constant velocity?
60. A body of mass 10 kg is acted upon by a force of 20 N. Find the acceleration.
61. A force of 100 N acts on a body. If the mass of the body is 50 kg, what is the acceleration?
62. What is the force of gravity? What is friction? How does it affect motion?
63. What are the types of friction? Explain each. What is the role of friction in daily life?