



**CLASS IX PHYSICS**  
**MOTION**  
**NUMERICALS FOR PRACTICE**

1. A particle is moving up an inclined plane. Its velocity changes from 25m/s to 10m/s in 5 seconds. What is its acceleration?
2. The velocity changes from 35m/s to 60m/s in 3 seconds. What is its acceleration?
3. A body covered a distance of 4 metre along a semicircular path. Calculate the magnitude of displacement of the body, and the ratio of distance to displacement?
4. A particle moving with an initial velocity of 8m/s is subjected to a uniform acceleration of  $2.5\text{m/s}^2$ . Find the displacement in the next 4 sec.
5. A train is travelling at a speed of 40 km/ h. Brakes are applied so as to produce a uniform acceleration of  $-0.5\text{ m/s}^2$ . Find how far the train will go before it is brought to rest.
6. A Truck covers 90km at a uniform speed of 30km/hr. what should be its speed for the next 120km if the average speed for the entire journey is 60km/h?
7. A stone is thrown in a vertically upward direction with a velocity of 15 m/s. If the acceleration of the stone during its motion is  $8\text{ m/s}^2$  in the downward direction, what will be the height attained by the stone and how much time will it take to reach there?
8. A person goes to market, makes purchases and comes back at a constant slower speed. Draw displacement- time and velocity time graphs of the person?
9. Rahul runs for 8 min. at a uniform speed 5 km/h. At what speed should he run for the next 10 min. so that the average speed comes 15km/hr?

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- 10.** A particle was at rest from 1 a.m. It moved at a uniform speed 40km/hr from 1.30 a.m. to 2:00 a.m. Find the average speed between
- (a) 1.00 a.m. and 2.00 a.m.
  - (b) 1.15 a.m. and 2.00 a.m.
  - (c) 1.30 a.m. and 2.00 a.m
- 11.** An object moves along a circular path of diameter 16cm with constant speed. If it takes 4 min. to move from a point on the path to the diametrically opposite point. Find
- (a) The distance covered by the object
  - (b) The speed
  - (c) The displacement
  - (d) average velocity.
- 12.** A particle with a velocity of 5m/s at  $t=0$  moves along a straight line with a constant acceleration of  $0.2\text{m/s}^2$ . Find the displacement of the particle in 15s?
- 13.** A particle is pushed along a horizontal surface in such a way that it starts with a velocity of 15m/s. Its velocity decreases at a uniform rate of  $0.5\text{m/s}^2$ . (a) Find the time it will take to come to rest.
- (b) Find the distance covered by it before coming to rest?
- 14.** A train accelerated from 30km/hr to 80km/hr in 5 minutes. How much distance does it cover in this period? Assume that the tracks are straight?
- 15.** A cyclist moving on a circular track of radius 100m completes one revolution in 8 minutes. What is his
- (a) average speed
  - (b) average velocity in one full revolution?
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15. A taxi driver noted the reading on the odometer fitted in the vehicle as 1052 km when he started the journey. After 30 minutes drive, he noted that the odometer reading was 1088 km. Find the average speed of the taxi.
16. A boy is running on a straight road. He runs 500 m towards north in 2 minutes 10 seconds and then turns back and runs 200 m in 1 minute. Calculate i) his average speed and magnitude of average velocity during first 2 minutes 10 seconds and ii) his average speed and magnitude of average velocity during the whole journey.
17. A train travels 20 km at a uniform speed of 60 km/h and the next 20 km at a uniform speed of 80 km/hr. Calculate its average speed.
18. An object dropped from a leaf false with a constant acceleration of  $10 \text{ m/S}^2$ . Find its Speed 2 second after it was dropped.
19. A body starts from rest and moves with a unifrom acceleration of  $2 \text{ m/S}^2$ . What will be its velocity and displacement at the end of 10 seconds?
20. A body moves with an initial velocity of  $2 \text{ m/s}$  and uniform acceleration of  $3 \text{ m/S}^2$ . Calculate the velocity when it has traveled a distance of 77 m.
21. An athlete completes one round of circular track of diameter 50 m in 10 second. What will be the distance cover and the displacement at the end of 45 second?
22. An object moves with an initial velocity of  $10 \text{ m/s}$  and uniform acceleration of  $0.5 \text{ m/S}^2$ . Calculate the velocity after 10 second and distance travelled in this time.
23. An object is dropped from rest at a height of 150 m and simultaneously another object is dropped from rest at a height 100 m. What is the difference in their heights after 2 second if both objects drop with same acceleration, how does the difference in heights vary with time?
24. An object starting from rest travels 20 m in first 2 second and 160 m in next 4 second. What will be the velocity after 7 second from the start?
25. A ball is thrown upwards with a speed of  $15 \text{ m/s}$ . What is its maximum height reached?
26. An object is projected upwards with an initial speed of  $25 \text{ m/s}$ . What is its velocity after 4 seconds?
27. A stone is dropped from a height of 80 meters. What is its speed just before it hits the ground? (Take  $g = 9.8 \text{ m/s}^2$ )
28. A body moves upwards with a uniform velocity of  $10 \text{ m/s}$ . What is the distance traveled by it in 2 seconds?
29. An object is thrown downwards with an initial speed of  $12 \text{ m/s}$ . What is its velocity after 3 seconds? (Take  $g = 9.8 \text{ m/s}^2$ )
30. A ball is thrown upwards with an initial speed of  $18 \text{ m/s}$ . What is its acceleration after 2 seconds?
31. A body falls from rest and travels 49 meters in 3.1 seconds. What is its acceleration? (Take  $g = 9.8 \text{ m/s}^2$ )
32. An object is projected upwards with an initial speed of  $30 \text{ m/s}$ . What is its velocity after 5 seconds? (Take  $g = 9.8 \text{ m/s}^2$ )

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33. A car travels from rest to a speed of 30 m/s in 6 seconds. What is its average acceleration?
34. A body falls from a height of 100 meters. What is its speed just before it hits the ground? (Take  $g = 9.8 \text{ m/s}^2$ )
35. An object moves with a uniform speed of 15 m/s. What is the distance traveled by it in 2.5 minutes?
36. A stone is thrown horizontally with an initial speed of 20 m/s from a height of 50 meters. What is its range? (Take  $g = 9.8 \text{ m/s}^2$ )
37. A body moves with a uniform acceleration of  $2 \text{ m/s}^2$ . If it travels 24 meters in 4 seconds, what is its initial velocity?
38. An object is projected upwards with an initial speed of 25 m/s at an angle of 60 degrees with the horizontal. What is its maximum height reached? (Take  $g = 9.8 \text{ m/s}^2$ )
39. A car travels 150 kilometers in 3 hours. What is its average speed? If it travels the same distance in 2 hours, what is its average acceleration?
40. A body falls from rest and travels 121 meters in 5 seconds. What is its acceleration? (Take  $g = 9.8 \text{ m/s}^2$ )
41. A body moves with a uniform acceleration of  $4 \text{ m/s}^2$ . If it travels 32 meters in 4 seconds, what is its initial velocity?
42. An object is moving with a uniform speed of 20 m/s. If it travels 120 meters in 6 seconds, what is its acceleration?
43. A body falls from a height of 150 meters. What is its speed just before it hits the ground? (Take  $g = 9.8 \text{ m/s}^2$ )
45. An object moves with a uniform velocity of 15 m/s for 10 seconds. Then, it accelerates uniformly at  $2 \text{ m/s}^2$  for 5 seconds. Find its final velocity and distance traveled.
46. An object moves with a uniform acceleration of  $3 \text{ m/s}^2$  for 10 seconds. Then, it moves with a uniform velocity of 30 m/s for 5 seconds. Find its total distance traveled.
47. A train travels from rest to 80 km/h in 10 minutes with uniform acceleration. Find its acceleration and distance traveled.
49. A body moves with a uniform velocity of 20 m/s for 5 seconds. Then, it decelerates uniformly at  $2 \text{ m/s}^2$  for 5 seconds. Find its final velocity and distance traveled.
50. An object moves with a uniform acceleration of  $4 \text{ m/s}^2$  for 12 seconds. Then, it moves with a uniform velocity of 40 m/s for 8 seconds. Find its total distance traveled.
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