

10TH AUGUST, 2022

PHYSICS TEST
CLASS 9TH : MOTION

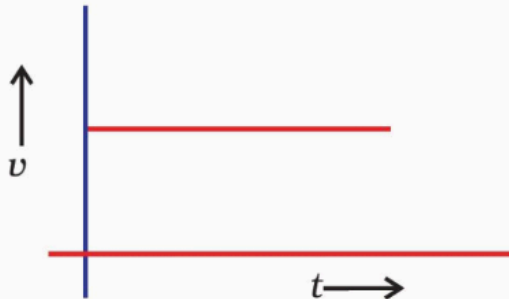
TIME ALLOWED: 2 HOURS

MAX. MARKS: 60

(1 mark each)

Multiple Choice Questions

1. If the displacement of an object is proportional to square of time, then the object moves with
 - (a) uniform velocity
 - (b) uniform acceleration
 - (c) increasing acceleration
 - (d) decreasing acceleration
2. The distance time graph of a body coincides with its time axis. The body must be
 - (a) in uniform motion
 - (b) at rest
 - (c) in uniformly accelerated motion
 - (d) in zig-zag motion
3. From the given $v - t$ graph (see below Fig.), it can be inferred that the object is
 - (a) in uniform motion
 - (b) at rest
 - (c) in non-uniform motion
 - (d) moving with uniform acceleration



4. The velocity time graph of a body is parallel to the time axis. The body is
 - (a) at rest
 - (b) having uniform acceleration
 - (c) having zero acceleration
 - (d) having non-uniform acceleration
5. A particle is moving in a circular path of radius r . The displacement after half a circle would be:
 - (a) Zero
 - (b) πr
 - (c) $2 r$
 - (d) $2\pi r$

6. Distinguish between speed and velocity. (1)

7. What does the path of an object look like when it is in uniform motion? (1)

(3 marks each)

8. A train starting from a railway station and moving with uniform acceleration attains a speed 40 km h^{-1} in 10 minutes. Find its acceleration.

9. A man travels a distance of 1.5 m towards East, then 2.0 m towards South and finally 4.5 m towards East.

(i) What is the total distance travelled ?

(ii) What is his resultant displacement ?

10. The train 'A' travelled a distance of 120 km in 3 hours whereas another train 'B' travelled a distance of 180 km in 4 hours. Which train travelled faster ?

11. A car travels 30 km at a uniform speed of 40 km/h and the next 30 km at a uniform speed of 20 km/h . Find its average speed.

12. On a 120 km track, a train travels the first 30 km at a uniform speed of 30 km/h . How fast must the train travel the next 90 km so as to average 60 km/h for the entire trip ?

13. A bus covers a distance of 250 km from Delhi to Jaipur towards West in 5 hours in the morning and returns to Delhi in the evening covering the same distance of 250 km in the same time of 5 hours. Find (a) average speed, and (b) average velocity, of the bus for the whole journey.

14. A driver decreases the speed of a car from 25 m/s to 10 m/s in 5 seconds. Find the acceleration of the car.

15. A train travels at a speed of 60 km/h for 0.52 h, at 30 km/h for the next 0.24 h and then at 70 km/h for the next 0.71 h. What is the average speed of the train ?

16. 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, $3 \times 10^8 \text{ m/s}$.

17. A bus starting from rest moves with a uniform acceleration of 0.1 m s^{-2} for 2 minutes. Find (a) the speed acquired, (b) the distance travelled.

18. A train starting from a railway station and moving with uniform acceleration attains a speed 40 km h^{-1} in 10 minutes. Find its acceleration.

19. Derive the second and third equation of motion mathematically.

20. A scooter acquires a velocity of 36 km per hour in 10 seconds just after the start. Calculate the acceleration of the scooter.

21. A body starts to slide over a horizontal surface with an initial velocity of 0.5 m/s. Due to friction, its velocity decreases at the rate of 0.05 m/s^2 (acceleration, $- 0.05 \text{ m/s}^2$). How much time will it take for the body to stop ?

22. Derive first equation of motion graphically.

23. A car travelling at 20 km/h speeds up to 60 km/h in 6 seconds. What is its acceleration ?

24. A cyclist goes around a circular track once every 2 minutes. If the radius of the circular track is 105 metres, calculate his speed.

25. A car is moving on a straight road with uniform acceleration. The following table gives the speed of the car at various instants of time :

Speed (m/s) : 5 10 15 20 25 30

Time(s) : 0 10 20 30 40 50

Draw the speed-time graph by choosing a convenient scale. Determine from it :

(i) the acceleration of the car.

(ii) the distance travelled by the car in 50 seconds.