8. Motion

Q 1 Define centripetal force.

Mark (1)

Q 2 When do we say the acceleration of a body is zero?

Mark (1)

Q 3 What is meant by non-uniform acceleration?

Mark (1)

Q 4 What is meant by uniform acceleration?

Mark (1)

Q 5 Define acceleration.

Mark (1)

Q 6 When does the velocity and speed of a moving body become identical?

Mark (1)

Q 7 What is meant by average velocity of a body moving in a particular direction?

Mark (1)

Q 8 When does the velocity change?

Mark (1)

Q 9 Define the term displacement.

Mark (1)

Q 10 Define the term distance.

Mark (1)

Q 11 What is a scalar quantity?

Mark (1)

Q 12 How is the position of an object described?

Mark (1)

Q 13 What is meant by body in motion?

Mark (1)

Q 14 What is meant by body at rest?

Mark (1)

Q 15 Why is uniform linear motion not an accelerated motion?

Mark (1)

Q 16 What is positive acceleration and negative acceleration?

Mark (1)

Q 17 What is meant by non-uniform velocity?

Mark (1)

Q 18 What is meant by uniform velocity?

Mark (1)

Q 19 Define velocity.

Mark (1)

Q 20 Define non-uniform motion.

Mark (1)

Q 21 Define uniform motion.

Mark (1)

Q 22 Define a vector quantity.

Mark (1)

Q 23 What is meant by angular acceleration?

Marks (2)

Q 24 What is meant by angular velocity? Write its SI unit.

Marks (2)

Q 25 Why is the motion of Satellites around their planets considered an accelerated motion?

Marks (2)

Q 26 A racing car has a uniform acceleration of 4 ms^{-2}. What distance will it cover in 10 seconds after the start?

Marks (2)

Q 27 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 250km in the same time of 5 hours.
Find
(a) Average speed
(b) Average velocity of the bus for the whole journey.

Marks (2)

Q 28 A car travels a distance of 200 km from Delhi to Ambala towards North in 5 hours.
Calculate
(i) Speed
(ii) Velocity of car for this journey.

Marks (2)

Q 29 What are equations of motion?

Marks (2)

Q 30 A body thrown vertically upward rises up to a height 'h', and comes back to the initial position.
Calculate
i) the total distance travelled by the body
ii) the displacement of the body.

Marks (2)

Q 31 Train A travells a distance of 120 km in 3 hours whereas another train B travells a distance of 180 Km in 4 hours. Which train travells faster.

Marks (2)

Q 32 Draw distance time graph for uniform and non uniform motion.

Marks (2)

Q 33 Convert speed of 72km/hr into
a) m/s
b) cm/s

Marks (2)

Q 34 What are the characteristics of scalar quantities?

Marks (2)

Q 35 A train starting from rest attains a velocity of 72 km h^{-1} in 5 min. Assuming that the acceleration is uniform, find
(i) The acceleration
(ii) The distance travelled by the train for attaining this velocity.

Marks (2)

Q 36 A cyclist goes around a circular track once every 2 minutes. If the radius of the circular track is 105 metres, calculate his speed.
(Given π = 22/7)

Marks (2)

Q 37 Why is uniform circular motion called accelerated motion?

Marks (2)

Q 38 A scooter moving at a speed of 10m/s is stopped by applying brakes which produce a uniform acceleration of –0.5 ms^{-2}. How much distance will be covered by the scooter before it stops?

Marks (2)

Q 39 A moving train is brought to rest within 20 sec by applying brakes. Find the initial velocity, if the retardation due to brakes is 2 m/s^2.

Marks (2)

Q 40 A driver changes the speed of car from 25m/s to 10m/s in 5 seconds. Find the acceleration of the car.

Marks (2)

Q 41 The average speed of a bicycle, an athlete and a car are 18 km/hr, 7 m/s and 2 km/min respectively. Which among these is the fastest and the slowest one?

Marks (2)

Q 42 An aeroplane lands at 432 km/hr and stops after covering a runaway of 4 km.
Calculate (i) acceleration (ii) time in which it comes to rest.

Marks (2)

Q 43 What are the characteristics of vector quantities?

Marks (2)

Q 44 The brakes applied to a car produced an acceleration of 6 ms^{-2} in the opposite direction of the motion. If the car takes 2s to stop after the application of brakes, calculate the distance it travels during this time.

Marks (3)

Q 45 A scooter acquires a velocity of 36km per hour in 10 seconds just after the start. Calculate the acceleration of the scooter.

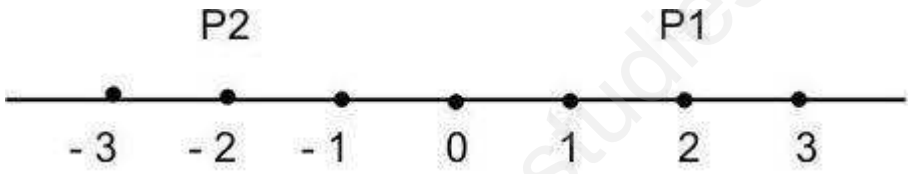
Marks (3)

Q 46 Consider the situation shown in fig. below: The x-axis is in meters

a) What is the position of a particle when it is at P_1 and when it is at P_2?

b) Are the positions same?

c) Are the two distance of the particle from the origin same?



Marks (3)

Q 47 A car covers 30 km at a uniform speed of 60 km/h and the next 30 km at a uniform speed of 40 km/h. Find the total time taken by the car.

Marks (3)

Q 48 A bus between Vishakhapatnam and Hyderabad passed the 100 km, 160 km and 220 km points at 10.30 a.m., 11.30 a.m. and 1.30. p.m. Find the average speed of the bus.

Marks (3)

Q 49 A man travels a distance of 1.5m towards East, then 2.0m towards South and finally 4.5m towards East.
i) What is the total distance traveled?
ii) What is his total displacement?

Marks (3)

Q 50 Define the following
a) Speed
b) Average speed
c) Uniform speed.

Marks (3)

Q 51 A particle is moving in a circle of radius 1m. Draw a diagram to show the following positions of the particle

a) 1m. from the center,30^0 North-East

b) 1m. from the center, 30^0 West-North

c) 1m. from the center towards South.

Marks (3)

Q 52 Differentiate between
a) Speed and Average speed
b) Speed and Velocity
c) Uniform linear motion and Uniform circular motion.

Marks (3)

Q 53 How many different types of velocity-time (speed-time) graphs are possible for a straight-line motion?

Marks (5)

Q 54 Explain using distance – time graphs
a)When the body is at rest
b)When the body is moving with a uniform speed
c)When the body is moving with a non-uniform speed.

Marks (5)

Q 55 A train travels at a speed of 60 km/hr for 0.52hr, at 30 km/h for the next 0.24 hr and then at 70 km/h for the next 0.71h.What is the average speed of the train?

Marks (5)

Q 56 Write the mathematical expression & S.I. units for the following
1. Speed
2. Average speed
3. Velocity
4. Average Velocity
5. Acceleration.

Marks (5)

Q 57 Manav runs from one end X to the other end Y of a straight 200m road in 2 minutes 30 seconds. Then, he turns back and covers another 80m to point Z in another 1 minute. Find Manav's average speed and velocities

(a) from X to Y.

(b) from X to Z.

Marks (5)

Q 58 An object starts from rest and is uniformly accelerated so that its speed is 60 m/s after 20s. If it travels with this speed for 40 s and is then brought to rest by a uniform retardation in 30 s. Sketch the velocity-time graph and calculate the acceleration, the retardation and the total distance travelled.

Marks (5)

Q 59 Two trains X and Y are running on parallel tracks with a speed of 72km/h and 54km/h respectively. The driver of train X applies the brake and it comes to a stop in 10seconds. While the driver of train Y applies the brake and the train retards uniformly before coming to rest in 15 seconds. Plot distance-time graphs for both the trains. Also, calculate the distance travelled by each train after the brakes were applied.

Marks (5)

Q 60 Derive the three equations of motion from the speed-time graph.

Marks (5)

Q 1 We say that displacement can be +ve, -ve or 0. Give example for each case.

Q 2 A bus is moving in a crowded area. What type of motion does it possess?

Q 3 A body is moving in such a way that in every 10 seconds it covers a distance of 15 m. What do you conclude from the statement?

Q 4 There is a park 3 km away from my home. On a particular day I went to the park with my brother. When we came back my father asked one question each from both of us. My answer was 6 km but that of my brother was 0 km. what do you infer from the description?

Q 5 What do you mean by the term motion?

Q 6 Write any two points to distinguish between uniform and non-uniform velocity.

Q 7 Does uniform motion mean the same as the uniform velocity? Explain.

Q 8 A cyclist goes around a circular track once every 2 minutes. If the radius of the circular track is 105 metres, calculate his speed. (Given Π = 22/7)

Q 9 What name is given to the speed in specific direction?

Q 10 Give one example of a situation in which a boy has a certain average speed but its average velocity is zero.

Q 11 What do the following measure in a car?
(a) Speedometer (b) Odometer.

Q 12 When does the velocity and speed of a moving body become identical?

Q 13 A car travels a distance of 300 km from Noida to Ambala towards North in 5 hours. Calculate (i) speed & (ii) velocity of car for this journey?

Q 14 Acceleration is the rate of change of velocity. Draw a graph to show the motion of a body with uniform acceleration.

Q 15 A car covers a distance from A to B at 40 km/h and while returning it travels at 50 km/h. calculate the average speed.

Q 16 We know that acceleration is the rate of change of velocity. A car is moving with constant velocity. Show that the acceleration is zero.

Q 17 Draw the graph to show non-uniform motion.

Q 18 Look at the table:

Time	10:30 am	11:00 am	11:30 am	12:00 noon	12:30 pm
Distance from origin point (KM)	0	15	28	40	60

1) Is the car is moving with constant speed?
2) What is the average speed?
3) Which duration represents the maximum velocity?

Q 19 Name the motion when distance travelled by an object decreases with time. Also show the distance time variation.

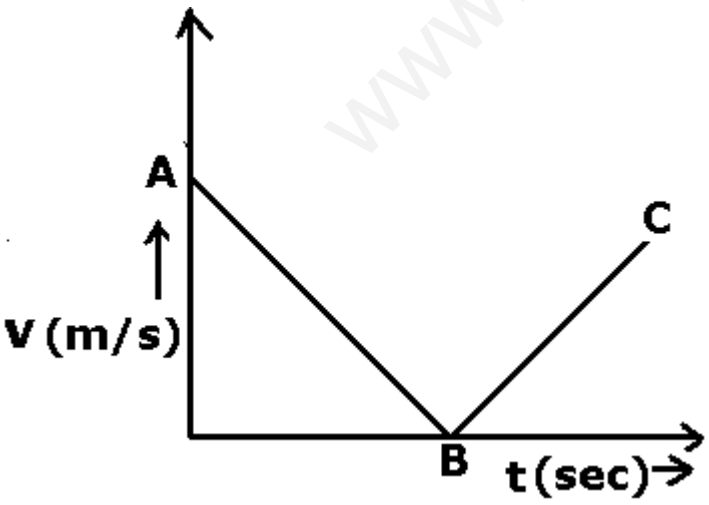
Q 20 A driver changes the speed of car from 10m/s to 20m/s in 5 seconds. Find the acceleration of the car?

Q 21 A stone is dropped freely from the top of a tower and it reaches the ground in 4 seconds. Calculate height of the tower. (g = 10 m/s^2)

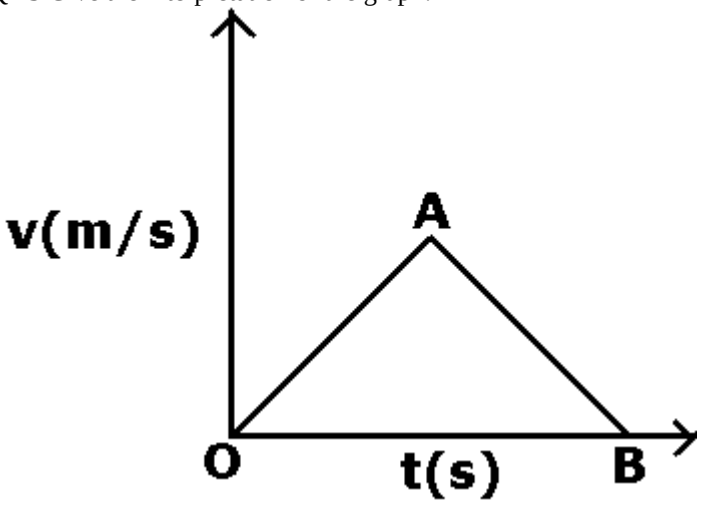
Q 22 From the top of a tower 45 m high, two stones are released. One vertically downwards and the other with a horizontal velocity of 30 m/s. How long will each stone take to strike the ground and how far from the tower will each stone strike the ground? (g = 10 m/s^2)

Q 23 A body starts from rest and acquire a velocity of 10 m/s in 2 seconds. Find acceleration.

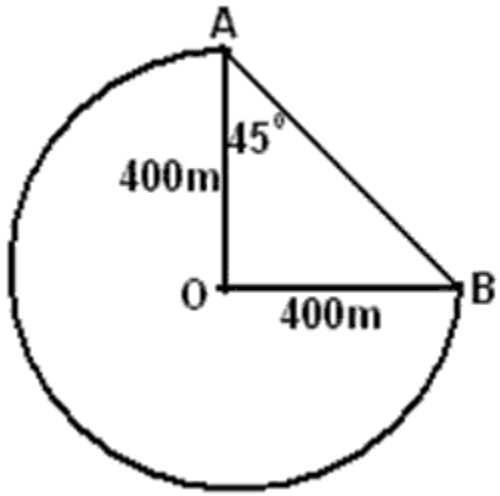
Q 24 Give the interpretation of the graph:



Q 25 Give the interpretation of the graph:



Q 26 A cyclist travels 3/4 of a circular track from A to B as shown in figure. The radius of the circular track is 400 m.



(i) What is the distance travelled by the cyclist?

(ii) What is the displacement?

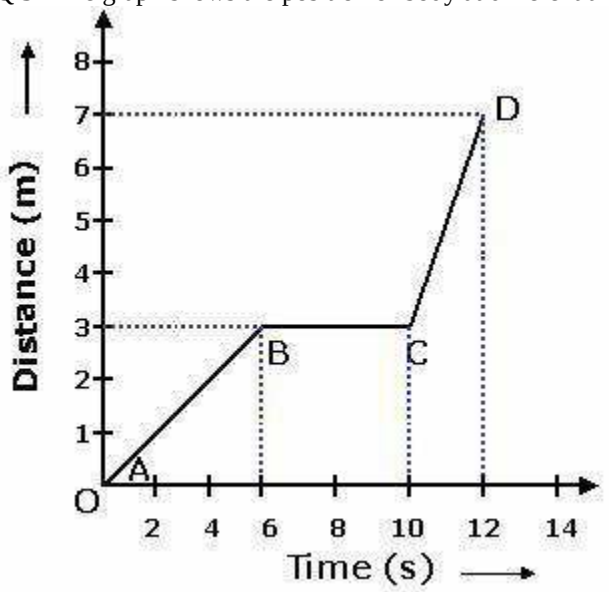
Q 27 State the reason, why velocity-time graph can never be a straight line parallel to velocity axis?

Q 28 Draw displacement-time and velocity-time graphs for a body moving with constant velocity.

Q 29 If initially the body is moving with some uniform velocity and then it accelerates, draw velocity-time graph for the motion.

Q 30 When acceleration due to gravity is positive and negative?

Q 31 The graph shows the position of body at different times. Calculate the speed of the body as it moves from:



(i) A to B

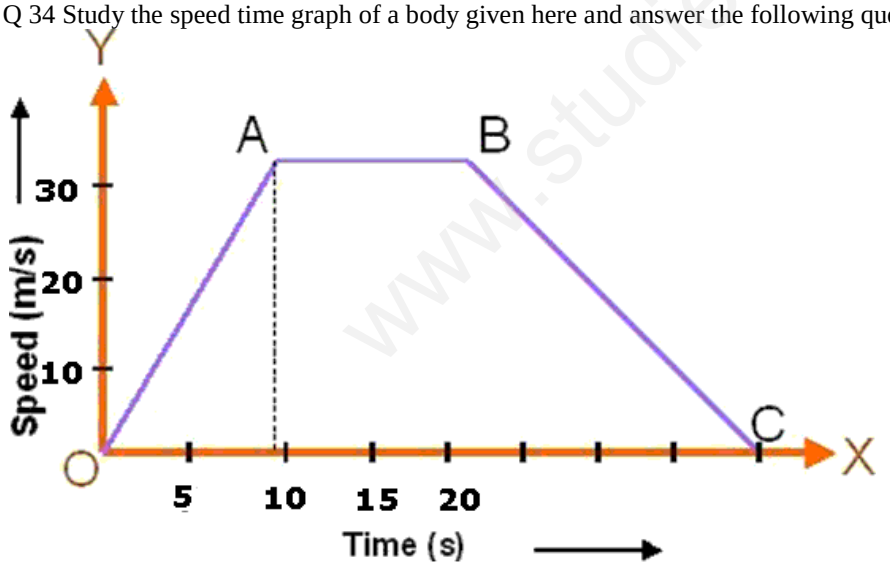
(ii) B to C and

(iii) C to D.

Q 32 A racing car has a uniform acceleration of 4m/s^2. What distance will it cover in 10 seconds after the start?

Q 33 What type of motion does a freely falling body exhibit?

Q 34 Study the speed time graph of a body given here and answer the following questions:



(a) What type of motion is represented by OA?

(b) What type of motion is represented by AB?

(c) What type of motion is represented by BC?