



## Motion in A Straight line

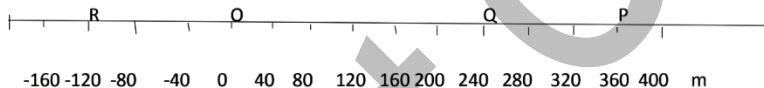
### General Instructions:

*Answer all the questions. If you are unable to answer any question, go through the page number that is given against that particular question in the text book. You can find the answer.*

**MAX MARKS: 30**

**TIME: 90Mts 1**

1. What is rectilinear motion [1]
2. Give any two differences between path length and displacement. [2]
3. Plot the Position-time graph of (a) stationary object, and (b) a uniform motion. [2]
4. Plot the position-time graph for an object (a) moving with positive velocity (b) moving with negative velocity, and (c) at rest. [3]
5. A car is moving along a straight line say along OP in the following figure. It moves from O to P in 18 s and returns from P to Q in 6.0s. What are the average velocity and average speed of the car in going (a) from O to P? and (b) from O to P and back to Q? R O Q P X-axis, origin and positions of a car at different times. [3]



X-axis, origin and positions of a car at different times.

6. Plot the Position-time graphs of a car for the data given in the question no.5 [2]
7. Define instantaneous velocity. Give the formula for finding the instantaneous velocity. Find the instantaneous velocity for the data given in Q. No.5 at time  $t=4s$  by plotting position -time graph. [3]
8. The position of an object moving along x-axis is given by  $x = a + bt^2$  where  $a = 8.5m$ ,  $b = 2.5ms^{-2}$  and  $t$  is measured in seconds. What is its velocity at  $t=0s$  and  $t= 2.0s$ . What is the average velocity between  $t=2.0s$  and  $t=4.0s$ ? Give your conclusion. [3]
9. Name the scientist Who concluded that the rate of change of velocity with time is a constant of motion for all objects in free fall. [1]
10. Plot the position-time graphs for motion of an object moving with positive, negative and zero acceleration. [3]
11. How will you determine the displacement of an object by using velocity-time graph? [1]
12. Derive the equations of motion for uniformly accelerated motion using velocity-time graph. [3]
13. Obtain equations of motion for constant acceleration using method of calculus. [3]