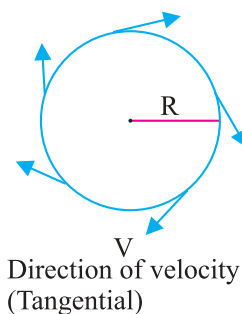


Uniform Circular Motion

If a body is moving in a circular path with uniform speed, then it is said to be executing uniform circular motion.

In such a motion the speed may be same throughout the motion but its velocity (which is tangential) is different at each and every point of its motion due to continuous change in direction. Thus, uniform circular motion is an accelerated motion.



$$v = \frac{2\pi r}{t}$$

QUESTIONS

VERY SHORT ANSWER TYPE QUESTIONS

1. Change the speed 6 m/s into km/hr.
2. What do speedometer and odometer used for ?
3. What is the other name of negative acceleration ?
4. What does the slope of distance-time graph indicate ?
5. What can you say about the motion of a body if its speed-time graph is a straight line parallel to the time axis ?
6. Define Motion.
7. Is distance is a scaler or vector quantity? Why?
8. Is displacement is a scaler quantity? Why?
9. Define average speed.
10. What is difference between speed and velocity?

SHORT ANSWER TYPE QUESTIONS

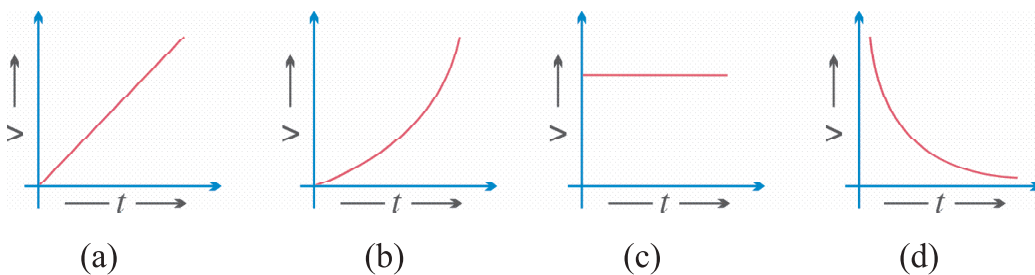
1. A tortoise moves a distance of 100 m in 15 minutes. What is its average speed in km/hr ?
2. If a bus travelling at 20 m/s is subjected to a steady deceleration of 5 m/s^2 , how long will it take to come to rest ?
3. What is the difference between uniform linear motion and uniform circular motion ?
4. Explain why the motion of a body which is moving with constant speed in a circular path is said to be accelerated.
5. Define velocity. What is SI unit of velocity?
6. What is meant by the term acceleration? Write its SI unit.
7. Write difference between 'distance' and 'displacement'.
8. Under what conditions can a body travel a certain distance and yet its resultant displacement be zero.
9. Is a uniform circular motion accelerated? Explain.
10. What type of motion is exhibited by a free falling body & why?

LONG ANSWER TYPE QUESTIONS

1. Derive the equations $v = u + at$, $s = ut + \frac{1}{2}at^2$ and $v^2 = u^2 + 2as$ graphically.
2. What is uniform circular motion ? Give two examples which force is responsible for that.
3. A car travels 30 kilometers at a uniform speed of 40 km/hr and next 30 km at a uniform speed of 20 km/hr. Find its average speed.
4. (a) Convert a speed of 54 km/hr into m/s.
(b) Change the speed of 6 m/s into km/hr.
(c) A driver decreases the speed of a car from 25 m/s to 10 m/s in 5 seconds. Find the acceleration of car.
5. A scooter acquires a velocity of 36 km/hr in 10 seconds just after the start. Calculate the acceleration of the scooter.

[Hint : change speed in m/s, $v = u + at$].

6. A car increase its speed from 20 km/hr to 50 km/min 10 seconds. Find its acceleration. [Hint : convert km/hr to m/s. $v = u + at$].
7. A cyclist goes around a circular path once every 2 minutes. If the radius of the track is 105 metres. Calculate his speed. $\left[v = \frac{2\pi r}{t}, \pi \frac{22}{7} \right]$.
8. Which type of motion is represented by each one of the following graphs?



Answer of Long Questions :

3. 26.6 km/hr.
4. (a) 15 m/s (b) 21.6 km/hr (c) $a = -3 \text{ m/s}^2$
5. $a = 1 \text{ m/s}^2$
6. $a = 0.83 \text{ m/s}^2$
7. $v = 5.5 \text{ m/s}$

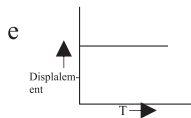
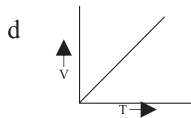
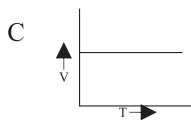
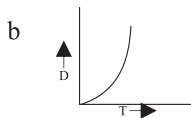
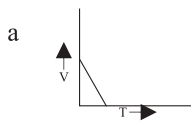
OBJECTIVE TYPES QUESTIONS

MCQ

1. **The numerical ratio of displacement to distance for a moving object is**
 - (a) equal to or less than 1
 - (b) always equals to 1
 - (c) always less than 1
 - (d) always more than 1
2. **Retanlation of a body is expressed in**
 - (a) m
 - (b) ms^{-1}
 - (c) $-\text{ms}^{-2}$
 - (d) ms^{-2}
3. **If the displacement time graph of a particle is parallel to the time axis, the velocity of the particle is**
 - (a) Unity
 - (b) Infinity
 - (c) Zero
 - (d) None of these
4. **The slope of velocity-time graph gives**
 - (a) the displacement
 - (b) the distance
 - (c) the acceleration
 - (d) the speed
5. **The distance covered by a bus moving with a speed of 36Km/hr is 15 min. is**
 - (a) 0.9Km
 - (b) 9 Km
 - (c) 90Km
 - (d) 900Km
6. **A body is thrown vertically upward with velocity 'u' the gracate height 'h' to which it will rise is,**
 - (a) $\frac{u}{g}$
 - (b) $\frac{u^2}{2g}$
 - (c) $\frac{u^2}{g}$
 - (d) $\frac{u}{2g}$

7. **Match the following :**

Column I



Column II

p. Constant velocity

q. Non-uniform speed

r. Body at rest

t. uniform retardation