UNIFORM AND NON-UNIFORM MOTION

1.(a) Identify the kind of motion in the following cases:

(i) A car moving with constant speed turning around a curve.

(ii) An electron orbitting around nucleus.

(b) An artificial satellite is moving in a circular orbit of radius 36,000 km. Calculate its speed if it takes 24 hours to revolve around the earth.

2. (a) Define average speed.

(b) A bus travels a distance of 120 km with a speed of 40 km/h and returns with a speed of 30 km/h. Calculate the average speed for the entire journey.

3. Define uniform and non-uniform motion. Write one example for each.

4. What does the odometer of an automobile measure? Which of the following is moving faster? Justify your answer.

(i) A scooter moving with a speed of 300 m per I minute.

(ii) A car moving with a speed of 36 km per hour.

5. A car travels from stop A to stop B with a speed of 30 km/h and then returns back to A with a speed of 50 km/h. Find

(i) displacement of the car.

(ii) distance travelled by the car.

(iii) average speed of the car.

6. Velocity-time graph for the motion of an object in a straight path is a straight line parallel to the time axis.

(a) Identify the nature of motion of the body.

(b) Find the acceleration of the body.

(c) Draw the shape of distance-time graph for this type of motion.

7. Draw the shape of the distance-time graph for uniform and non-uniform motion of object. A bus of starting from rest moves with uniform acceleration of 0.1 ms^{-2} for 2 minutes. Find

(a) the speed acquired.

(b) the distance travelled.

8. (a) Define uniform acceleration. What is the acceleration of a body moving with uniform velocity?

(b) A particle moves over three quarters of a circle of radius r. What is the magnitude of its displacement?

9. A bus accelerates uniformly from 54 km/h to 72 km/h in 10 seconds Calculate

(i) acceleration in m/s^2

(ii) distance covered by the bus in metres during this interval.

10. A car moves with a speed of 30 km/h^{-1} for half an hour, 25 km/h^{-1} for one hour and 40 km/h^{-1} for two hours. Calculate the average speed of the car.