

National Institute of Open Schooling
Senior Secondary Course – Physics
Lesson – 2 : Motion In A Straight Line
Worksheet - 2

- Q1.** Woman starts from her home at 10:00 am for a walk with a speed of 10km/h on a straight road up to parlour that is 5km away. She stays there till 2:00 pm and returns home by an auto with speed of 15km/h. Choose suitable scales and plot the x-t graph of her motion.
- Q2.** On a two lane road, Car A is travelling with the speed of 42 km/h. Two cars, Car B and Car C approaches Car A in opposite direction with the speed of 86 km/h each. At a certain instant, when the distance between Car A and Car B is equal to Car B and Car C, both being 1km. Car B decides to overtake Car A before Car C does. What minimum acceleration of Car B is required to avoid an accident?
- Q3.** Observe moving things in your surroundings and note their speed/velocity. Give explanation how does velocity differ from speed? Support your answer why velocity is a vector, but not speed.
- Q4.** A Policeman moving on a highway with a speed of 25 km/h fires a bullet at a thief's car speeding away in the direction with 100 km/h. With what speed does bullet hit the thief's car if muzzle speed of bullet is 120km/h?
- Q5.** Measure the height of the roof of your house from ground. Drop a stone from the roof of your house and let it fall freely. Calculate the:
- (i) Distance travelled in 3s,
 - (ii) Velocity of the stone when it reaches the ground, and
 - (iii) Velocity at 2s after the start.
- Q6.** Drop a ball with full force on the ground and note down its displacement with time.
- a) Plot displacement vs time graph.
 - b) Plot qualitatively velocity vs time graph.
 - c) Plot qualitatively acceleration vs time graph.
- Q7.** Just observe the rain. You will observe that rain clouds are at about some kilometer altitude above the ground say it's one kilometer above the ground. (a) If a rain drop falls from such a height freely under gravity, what will be the speed of rain in SI units? Convert the calculated speed in km/h. ($g = 10\text{m/s}^2$)
- Q8.** If you and your friend ride a bicycle on the road, you will notice that at different times, both bicycles are found at different positions. Note down five positions at five time intervals for each.
- a) Plot Position Time Graph for Uniform Motion
 - b) Plot Position Time Graph for Non Uniform Motion
 - c) Calculate Velocity from Position Time Graph
 - d) Calculate Distance travelled by you and your friend in 10 Minutes
 - e) Examine whose speed is more?