**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:

1. Distance travelled in 3s,
2. Velocity of the stone when it reaches the ground, and
3. Velocity at 2s after the start.

**Q6.**Drop a ball with full force on the ground and note down its displacement with time.

1. Plot displacement vs time graph.
2. Plot qualitatively velocity vs time graph.
3. 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 = 10m/s2)

**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.

1. Plot Position Time Graph for Uniform Motion
2. Plot Position Time Graph for Non Uniform Motion
3. Calculate Velocity from Position Time Graph
4. Calculate Distance travelled by you and your friend in 10 Minutes
5. Examine whose speed is more?