FREEDOM INTERNATIONAL SCHOOL

WORKSHEET

PHYSICS

CLASS XI

MOTION IN A STRAIGHT LINE

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1. A body travels the first half of the total distance with velocity v_1 and the second half with velocity v_2. Calculate the average velocity.
2. A car covers the first half of the distance between two places at a speed of 40 km/h and the second half at 60 km/h. What is the average speed of the car?
3. The distance x of a particle moving in one dimension, under the action of a constant force is related to time t by the equation, $t = \sqrt{x} + 3$, where x is in metres and t in seconds. Find the displacement of the particle when its velocity is zero.
4. The distance traversed by a particle moving along a straight line is given by $x = 180\,t + 50\,t^2$ metre. Find:
   (i) the initial velocity of the particle
   (ii) the velocity at the end of 4 s and
   (iii) the acceleration of the particle.
5. An electron travelling with a speed of 5 x 10^3 m/s passes through an electric field with an acceleration of 10^{12} m/s^2. (i) How long will it take for the electron to double its speed? (ii) What will the distance covered by the electron in this time be?
6. Two buses A and B are at positions 50 m and 100 m from the origin at time t = 0. They start moving in the same direction simultaneously with uniform velocity of 10 m/s and 5 m/s. Determine the time and position at which A overtakes B.
7. An object moving with uniform acceleration has a velocity of 12 cm/s in the positive x direction when its x coordinate is 3.0 cm. If its x coordinate 2.0 s later is -5.0 cm what is its acceleration?
8. A bus starts from rest with a constant acceleration of 5 m/s^2. At the same time a car travelling with a constant velocity of 50 m/s overtakes and passes the bus. (i) Find at what distance the bus overtakes the car (ii) How fast will the bus be travelling then?
9. The reaction time for an automobile driver is 0.6 s. If the automobile can be decelerated at 5 m/s^2, calculate the total distance travelled in coming to stop from an initial velocity of 30 km/h, after a signal is observed.
10. A ball rolls down an inclined track 2 m long in 4 s. Find (i) acceleration and (ii) speed of the ball at the bottom of the track.