

Girls' High School & College, Prayagraj

Worksheet No. - 3

Session 2020-2021

Class - IX A B C D E F

Subject- Physics

Chapter- Motion in One Dimension

Instructions:- Parents are expected to ensure that the student spends two days to read and understand the chapter according to the books and websites referred and thereafter answer the given questions. Student should refer to books of class 6, 7, 8 and also the following books/website-

Concise Physics By R. P. Goyal and S. P. Tripathi (Selina Publisher) OR

A New Approach to I.C.S.E. Physics by V. K. Sally and D. Chauhan (Goyal Brothers Prakashan)

OR

website-http://quiznext.in/study-material/learning_material/ICSE-9-Physics/Motion-in-One-Dimension/some-terms-related-to-motion/

OR

<http://www.learnhive.net/learn/icse-grade-9#physics>

Topics :- 1. SOME TERMS RELATED TO MOTION
2. GRAPHICAL REPRESENTATION OF LINEAR MOTION
3. EQUATIONS OF MOTION

1) Questions based on Terms Related to Motion:-

(A) Answer the following questions briefly:-

Q.1:- Identify whether the following quantity is a scalar or vector?

- | | |
|-------------|-----------------|
| a) Work | b) Length |
| c) Pressure | d) Acceleration |
| e) Power | f) Density |
| g) Force | h) Temperature |

i) Quantity of heat

j) Torque

k) Electric Field

l) Dipole Moment.

Q.2:- Define the following.

a) Displacement

b) Distance

c) Speed

d) Velocity

e) Acceleration.

Q.3:- (i) Distinguish between the uniform velocity and the variable velocity.

(ii) When is the instantaneous speed same as the average speed?

Q.4:- (i) Give one example of each of the following motion.

a) Uniform acceleration

b) Non-uniform acceleration

c) Retardation.

(ii) Give an example of motion of a body moving with a constant speed, but with a variable velocity. Draw a diagram to represent such a motion.

Q.5:- Which of the quantity speed or velocity gives the direction of motion of body?

Q.6:- (i) Define the term acceleration due to gravity. State its average value.

(ii) 'The value of g remains same at all places on the earth surface'. Is this statement true? Give reason for your answer.

Q.7:- State the C.G.S. and S.I. units of acceleration.

Q.8:- Give an example of motion in which average speed is not zero, but the average velocity is zero.

(B) Numerical problems :-

Q.9:- Express 15 m/sec in km/h.

Q.10:- A truck moving on a straight path covers a distance of 5 km due east in 500 s.

What is (i) the speed and (ii) the velocity, of truck?

Q.11:- A body starts from rest and acquires a velocity 10 m/sec in 2 sec. Find the acceleration.

Q.12:- A train takes 3 h to travel from Agra to Delhi with a uniform speed of 65 km/h. Find the distance between two cities.

Q.13:- Arrange the following speeds in increasing order :

10 m/s, 1 km/min, 18 km/h.

Q.14:- A car accelerates at a rate of 5 m/s^2 . Find the increase in its velocity in 2 s.

Q.15:- A car starting from rest acquires a velocity 180 m/s in 0.05 h. Find the acceleration.

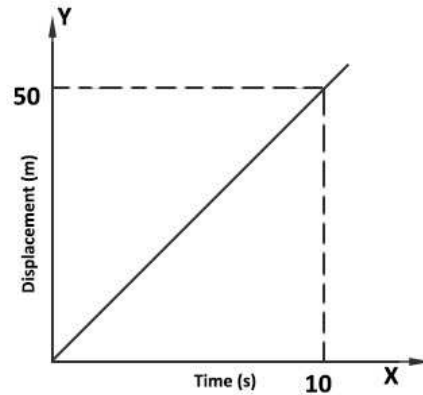
2) Questions based on Graphical Representation of Linear Motion:-

(A) Answer the following questions briefly:-

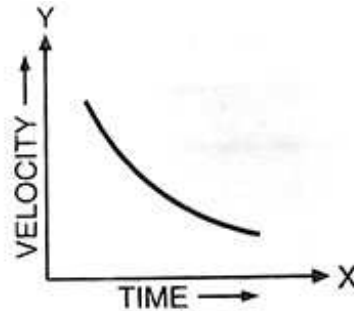
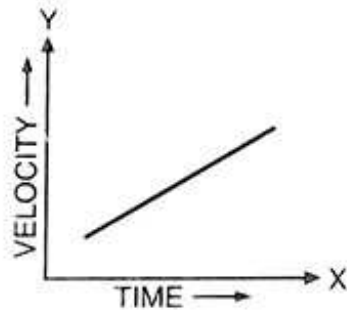
Q.1:- What can you say about the nature of motion of a body if its displacement-time graph is

- a) a straight line parallel to time axis?
- b) a straight line inclined to the time axis with an acute angle?
- c) a straight line inclined to the time axis with an obtuse angle?
- d) a curve?

Q.2:- From the given displacement-time graph, find the velocity of the moving body.



Q.3:- State the type of motion represented by the following graphs.



Q.4:- Draw the following graphs under the given condition.

- a) Draw a velocity-time graph for a body moving with an initial velocity u and uniform acceleration a .
- b) Draw a velocity-time graph for the free fall of a body under gravity, starting from rest.
- c) Draw a displacement-time graph for a boy going to school with a uniform velocity.

Q.5:- Can displacement-time graph be parallel to the displacement axis?

Give reason to your answer.

Q.6:- What does the slope of a displacement-time graph represent?

Q.7:- State how the velocity-time graph can be used to find (i) the acceleration of the body, (ii) the distance travelled by the body in a given time, and (iii) the displacement of the body in a given time.

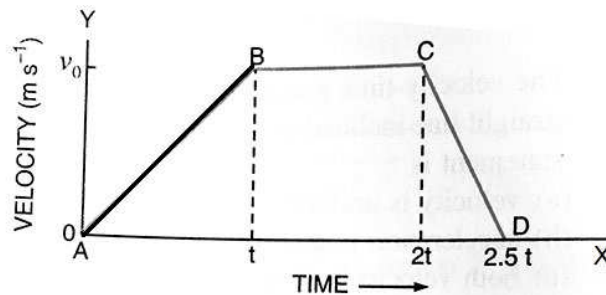
(B) Numerical problems :-

Q.8:- Following table gives the displacement of a car at different instants of time.

Time (s)	0	1	2	3	4
Displacement (m)	0	5	10	15	20

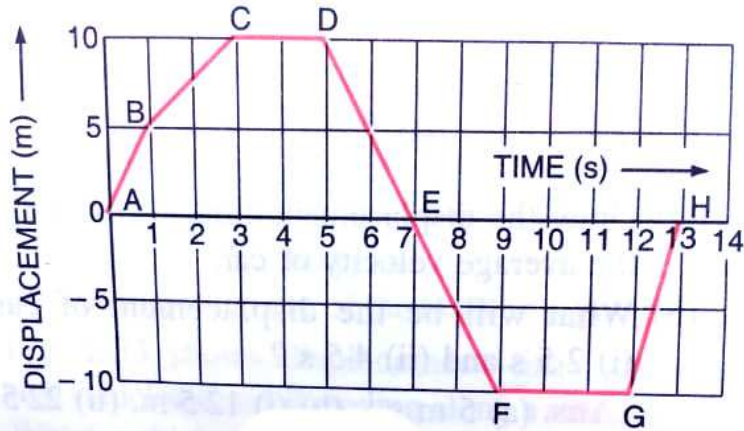
- Draw the displacement-time sketch and find the average velocity of car.
- What will be the displacement of car at (i) 2.5 s and (ii) 4.5 s?

Q.9:- Fig. given below shows a velocity-time graph for a car starting from rest. The graph has three parts AB, BC and CD.



- Compare the distance travelled in part BC with the distance travelled in part AB.
- Which part of graph shows motion with uniform velocity?
- Which part of graph shows motion with uniform acceleration?
- Is the magnitude of acceleration higher or lower than that of retardation?
- Compare the magnitude of acceleration and retardation.

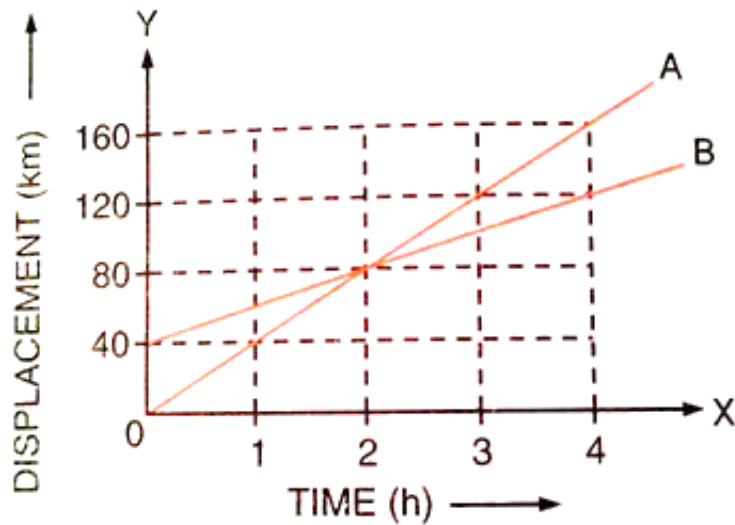
Q.10:- Figure given below shows the displacement-time graph of a cyclist.



Find:

- (i) the average velocity in the first 4 s,
- (ii) the displacement from the initial position at the end of 10 s,
- (iii) the time after which he reaches the starting point.

Q.11:- Figure shows the displacement – time graph of the motion of two cars A and B.



Find :

- a) the distance by which the car B was initially ahead of car A.
- b) the velocities of car A and car B.
- c) the time in which the car A catches the car B.
- d) the distance from start when the car A will catch the car B.

3) Questions based on Equations of Motion:-

Numerical problems :-

Q.1:- A body starts from rest with a uniform acceleration of 2 m/s^2 . Find the distance covered by the body in 2 s.

Q.2:- A body, initially at rest, starts moving with a constant acceleration 2m/s^2 .

Calculate :

- (i) the velocity acquired and
- (ii) the distance travelled in 5 s.

Q.3:- A body moving with a constant acceleration travels the distances 3m and 8m respectively in 1 sec and 2 sec. Calculate :

- a) the initial velocity, and
- b) the acceleration of body.

Q.4:- A train moving with a velocity of 20 m/s is brought to rest by applying brakes in 5 s. Calculate the retardation.

Q.5:- A body moves from rest with a uniform acceleration and travels 270 m in 3 s. Find the velocity of the body at 10 s after the start.

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