

Exercises

Ex. A) Fill in the blanks :. (Ans.)

- (1) second
- (2) pendulum
- (3) circular motion
- (4) Odometer and speedometer
- (5) translational

(B) Choose the correct options:

- (1) Simple pendulum was invented by the Italian scientist Galileo Galilee in.....

Ans. 1581

- (2) Any change in position of object with time is called as.....

Ans. motion

- (3) Motion of rabbit is an example of which type of motion ?

Ans. Oscillatory

- (4) Which is a type of motion if an object covers distance in Fixed interval of time ?

Ans. Uniform motion

- (5) It is based on principle of Shadow formed due to sunlight which varies with the position of sun.

Ans. Sundial

(C) State whether the given statements are true or false:

- (1) True
- (2) False
- (3) False
- (4) False

(D) Answer in Brief: (Ans.)

(1) In ancient times, when there were no clocks the time was measured on the basis of periodic movement of the heavenly body. The natural 'periodic events' which used to occur during early times were the occurrence of ' full moon' and 'sunrise'.

With time, instruments were made to measure time like sand clock, sundial, water clock etc.

(1) Sand clock : It has two rounded glass bulb placed one above each other connected by a narrow glass bulb. The sand in upper glass tube flows within the lower glass bulb. It is also known as hourglass.

(2) Sundial : It is based on principle of length of Shadow formed due to sunlight at various positions of Sun during the day. The plane used to be divided into equal hours determined by seasons.

(3) Water clock : people used water clocks at night when the shadow and sun were not there and when it was cloudy. The time using water clock by just looking at the changing water level.

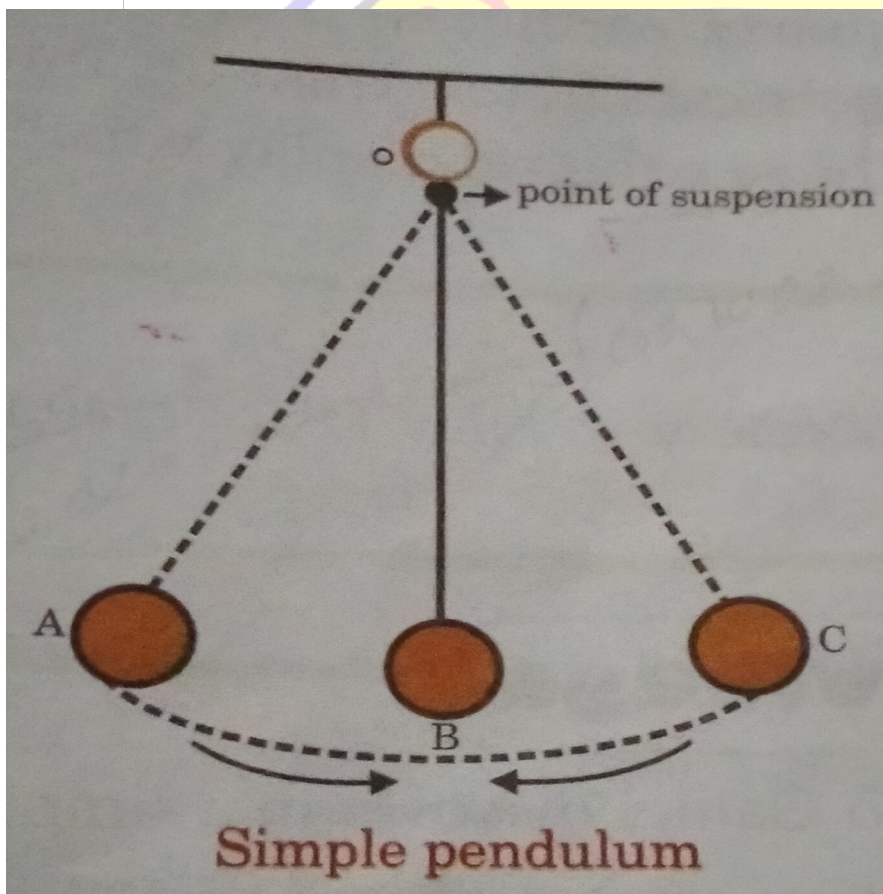
(2) A mass suspended from a fixed point allowed to swing to and fro under the influence of gravity is called pendulum.

It's related terms like:

(a) Time period: The time taken by the pendulum to complete one oscillation is called it's time period (t). The SI unit of time is second (s). It depends on the length of string.

(b) Frequency: Number of oscillations a pendulum makes in one second is called frequency (f). More the frequency, lesser is the time period.

Frequency and time period are inversely related quantities. Frequency refers to how often something happens whereas period refers to the time it takes for something to happen.



(3) Motion: when an object change its position with time or surrounding, it is said to be in motion.

There are different types of motion such as rectilinear, periodic, rotational, oscillatory, vibratory, curvilinear motion.

(a) Motion of an object along a straight line is known as rectilinear motion. Example : the motion of a vehicle on a straight road.

(b) Motion of an object along a curve line is known as curvilinear motion. Example : a car moving along a curved path.

(c) Motion of an object along a circle is known as circular motion. Example: motion of cyclist along circular park.

(d) When an object repeats it's motion after every fixed interval of time, the motion of the object is

called periodic motion. Example: motion of a pendulum.

(4) Average speed : The total distance covered by a moving object in total time taken is the average speed of the object. It depends on two factors:

(a) Total distance travelled. (b) Total time taken

The relationship between speed, distance and time are :

Speed - Distance/ Time (S - D/ T)

This shows the relationship between speed, distance travelled and time taken. Speed is distance divided by time taken.

Example : A boy travels a distance of 6 km in 2 hr. What is the speed by which he is travelling?

$$S = D/T. = 6\text{km}/2\text{hr} = 3\text{km/hr}$$

(5) Motion and rest are relative terms that means it all depends upon the observer who is observing the object .An object that changes its position is said to be in motion while the position action causes an object to be at rest.

Example: a person standing in a moving bus is at rest with respect to bus and is in motion with respect to observer on the ground.

(6) (a) An example of a combination of motion is pendulum as it involves vibratory motion along with periodic motion too.

(b) Motion of cyclist as it involves curvilinear motion along with circular motion.

(7) The difference between uniform and non uniform motion are:

(a) Uniform motion: (1)An object travels a distance in same speed then object is said to be in uniform motion.

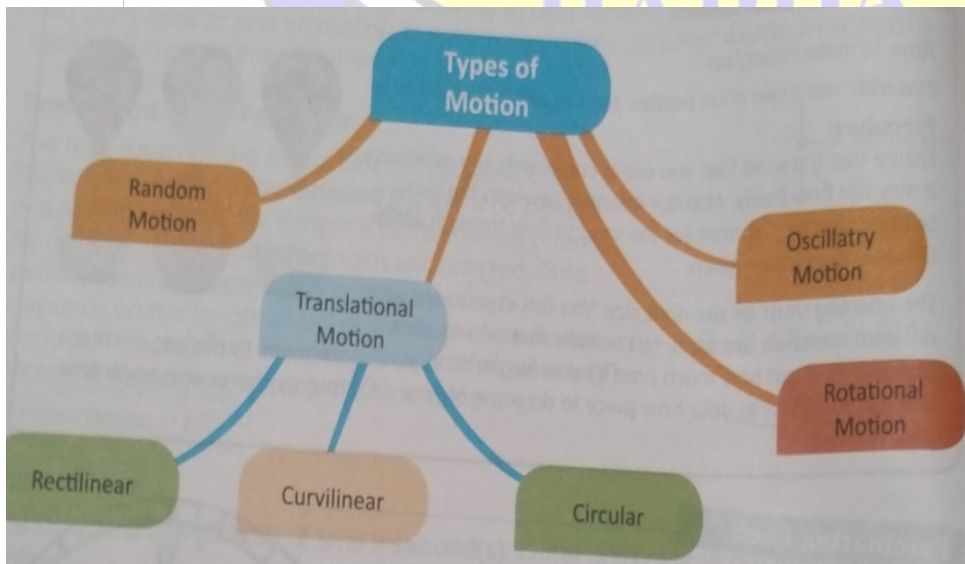
(2) In this motion, a body moves with a constant speed such as the motion of earth around the sun.

(b) Nonuniform motion : (1) When an object does not travel with same speed then the motion is called non uniform motion.

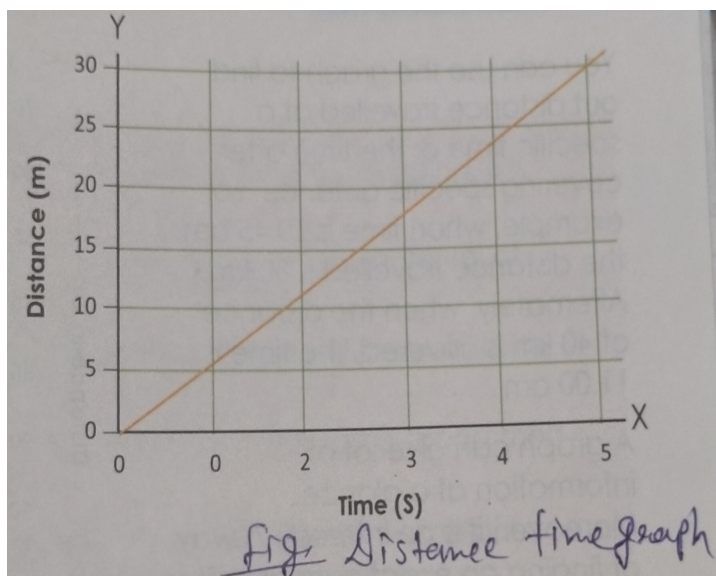
(2) In this motion, a body moves with a variable speed such as a horse running in the race.

(E) Answer the following questions: (Ans.)

(1) There are different types of motion such as rectilinear, periodic, rotational, oscillatory, vibratory, curvilinear motion.



(2) A graph is a pictorial representation of a variation of one quantity with respect to other. it is a straight or curved line showing the relation between two variables of which one varies as a result of change in other. Time - distance graph shows us the relation between time taken and distance travelled by the objects.



(3) Speedometer and odometer are devices fitted on vehicles. They are used to measure speed and distance travelled by the vehicles respectively. Speedometer measure speed in the form of motion and display it in kilometre/hour. Odometer records the distance travelled by the vehicles. Speedometer is used to keep a check on over speeding and help in maintaining a safe speed to drive safely. Odometer are used to construct roads and to survey land.

(4) Motion can be slow and fast. It is a comparison of motion of different object. The movement of a body can also be termed as slow or fast depending upon the distance travelled by it in a given interval of time. For instance, some vehicles move faster than others. Even the same vehicle may move faster or slower at different times. Slow or fast motion can be determined by "the distance travelled by an object in a given time interval."

HOTS :

(1) Given,

Speed (s)= 30 km/hr

Time (t) = 2.5 hours

Distance (d) = ?

$$d = s \times t$$

$$= 30 \text{ km/hr} \times 2.5 \text{ hrs.}$$

$$= 30 \times 25/10$$

$$= 75 \text{ km total distance did he cover (Ans.)}$$

(2) Given,

Distance (d) = 3600km

Speed (s)= 60km/hr

Time (t) = ?

$$t = d/s$$

$$t = 3600 \text{ km} / 60 \text{ km/hr.}$$

$t = 60\text{hrs}$ (The total time would the train take to reach Kashmir from Kanyakumari)

(3) Given,

Time (t)= 20 secs.

No. of oscillations= 10

$T = 20 \text{ secs.}/10 \text{ oscillations}$

$T = 2 \text{ sec.}$ (complete one oscillation by a simple pendulum)

