



INDIAN SCHOOL AL WADI AL KABIR



Class: VII	DEPARTMENT: SCIENCE 2021-2022	DATE: 29.08.2021
WORKSHEET NO: 7 WITH ANSWERS	TOPIC: MOTION AND TIME	NOTE: A4 FILE FORMAT
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO.

I. VERY SHORT ANSWER TYPE QUESTIONS (1M):

1. Name any two devices which were used for measuring time in ancient period before pendulum clocks were made. [Hint- sand clock and sundial]

2. Define speed. What is its basic unit?

[Hint -The distance moved by an object in unit time is called speed. Its basic unit is metre per second (m/s)]

3. Mention the standard units of distance and time. [Hint-metre (m) and second (s)]

4. Write the formula for calculating speed. [Hint- Speed = Distance/Time]

5. What do the speedometer and odometer of a car record? [Hint: Speedometer of a car records speed of the car in km/h. Odometer of car measures the distance moved by the vehicle in km.]

6. What was a year as per our ancestors? [Hint- A year was considered as the time taken by the earth to complete one revolution around the sun.]

7. What is meant by periodic motion? [Hint- The type of motion which is repeated in regular intervals of time.]

8. What do you mean by the statement 'a car is moving with the speed of 50km/h'? [Hint: The car has covered 50 kilometre in 1 hour.]

9. What is meant by time period of a simple pendulum?

[Hint: The time taken by the pendulum to complete one oscillation is called its **time period.**]

10. What are quartz clocks? Write its advantage. [Hint- Quartz clock is a special type of clock or watch which has an electric circuit with one or more cells. It gives more accurate time.]

For the questions that follows, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below:

- i) Both A and R are true and R is the correct explanation of the assertion.**
- ii) Both A and R are true but R is not the correct explanation of the assertion.**
- iii) A is true but R is false.**
- iv) A is false but R is true.**

11. Assertion (A): When a pendulum moves to and fro from its fixed position it is said to complete one oscillation.

Reason (R): Time period is the time taken by a pendulum to complete one oscillation.

Ans (ii) Both A and R are true but R is not the correct explanation of the assertion.

12. Assertion (A): The revolution of the earth around the sun is a periodic motion.

Reason (R): The type of motion where object repeats its motion after equal intervals of time is called as periodic motion.

Ans. (i) Both A and R are true and R is correct explanation of the assertion.

13. Assertion (A): A faster moving object covers more distance in less time.

Reason (R): The speed of faster moving object is less.

Ans. (iii) A is true but R is false.

II. PASSAGE BASED QUESTIONS:

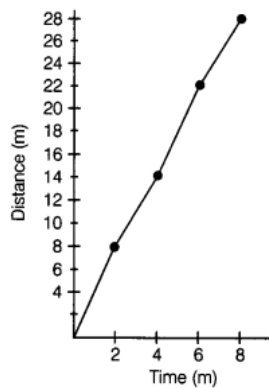
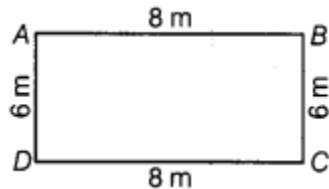
One of the most well-known periodic motions is that of a simple pendulum. A simple pendulum consists of a small metallic ball or a piece of stone suspended from a rigid stand by a thread. The metallic ball is called the bob of the pendulum. The to and fro motion of a simple pendulum is an example of a periodic or an oscillatory motion. The pendulum is said to have completed one oscillation when its bob, starting from its mean position move to its extremes and back to mean position. The pendulum also completes one oscillation when the bob moves from one extreme position to the other extreme and come back to the first extreme position. The time taken by the pendulum to complete one oscillation is called its time period. The two factors on which time period of a pendulum depends are- the length of a string and the resistance offered by air.

- i) Which among the following is an incorrect statement?
 - a) Increase or decrease in the length of the string will increase or decrease the time period respectively.

- b) The metallic bob is free to swing on the rigid stand.
 - c) **The pendulum is at rest in its extreme positions.**
 - d) The pendulum of a given length takes always the same time to complete one oscillation.
- ii) The simple pendulum is an example of
- a) Periodic motion
 - b) Oscillatory motion
 - c) Circular
 - d) **Both a and b**
- iii) Time period is
- a) **Total time taken/No: of oscillations**
 - b) No: of oscillations/Time taken
 - c) Distance/Time
 - d) Distance/No: of oscillations
- iv) One oscillation is completed when the bob of the pendulum moves from
- a) One extreme to the other
 - b) **One extreme to the other and back to first extreme position**
 - c) The mean position to one extreme and to the other extreme.
 - d) The extreme to its mean position

III. CASE STUDY BASED QUESTIONS:

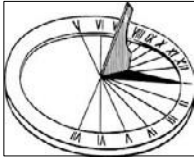
1. Starting from A, Paheli moves along a rectangular path ABCD as shown in figure. She takes 2 min to travel each side. Study the distance-time graph and explain whether the motion is uniform or non-uniform.



[Hint-Since, the distance covered per unit time for the entire distance covered is not the same, the motion is a non-uniform motion.]

IV a) SHORT ANSWER TYPE QUESTIONS: (2M)

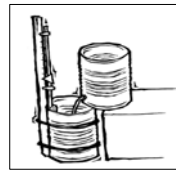
1. Distinguish between uniform and non-uniform motion. [Hint-If a body covers equal distances in equal intervals of time, then the motion is said to be uniform. If a body covers unequal distances in equal intervals of time, then its motion is called non-uniform motion.]
2. Identify the time measuring devices given below:



[Sundial



Sand clock



Water clock]

2. A rocket travels at a speed of 15,000 m/s. Express this speed in km/h.
[Hint- $1 \text{ m/s} = 3.6 \text{ km/h}$ or $18/5 \text{ km/h}$, 54,000km/h.]
3. A simple pendulum takes 15 seconds to complete 5 oscillations. What is the time period of pendulum?
[Hint-Time period=Total time taken/No: of oscillations, 3s]
4. A truck travels a distance of 540 km in 4.5 hours. Calculate its speed.
[Hint- Speed=Distance/Time, 120km/h]
5. A bus travels a distance of 480 km in 8 hours and a train covered a distance of 1200 km in 10 hours. Which one of the two travels faster- car or a train?
[Hint: Car-60km/h, Train- 120km/h. Train travels faster]
6. Find the distance between New Delhi to U.S.A, if an airplane moving with a speed of 900 km/h takes 12 hours to travel from Delhi to U.S.A.
[Hint- Distance = Speed x Time, 10,800 km]
7. Rohan cycles down from his house to his school at a speed of 18 km/h and reaches in 30 minutes. How far is his school from his house?
[Hint- Distance = Speed x Time, 9km]
8. A boy walks at a speed of 4 km/h. How much time does he take to walk a distance of 20 km?
[Hint- Time=Distance/Speed, 5 h]
9. At 7.00 am, the odometer of a car reads 25777. What is the distance covered by the car and its speed when the clock reads 9.15 am and the odometer reads 25867?
[Hint- Distance covered = the difference in the reading of odometer, 90km.

Speed = Distance/Time, 40 km/h]

IVb) SHORT ANSWER TYPE QUESTIONS: (3M)

1. Mention different types of motion with examples.

Rectilinear- soldiers in a march past

Circular- Pedal of a bicycle in motion

Periodic-motion of the earth around the sun

Rotational-Turning of potter's wheel

Oscillatory motion- motion of a swing

2. Differentiate circular and rotatory motion with examples.

A type of motion in which objects move along a circular path is known as circulatory motion. Example-Movement of the earth around the sun. The type of circular motion where an object spins on its own axis is called rotational motion. Example- Rotation of earth on its axis.

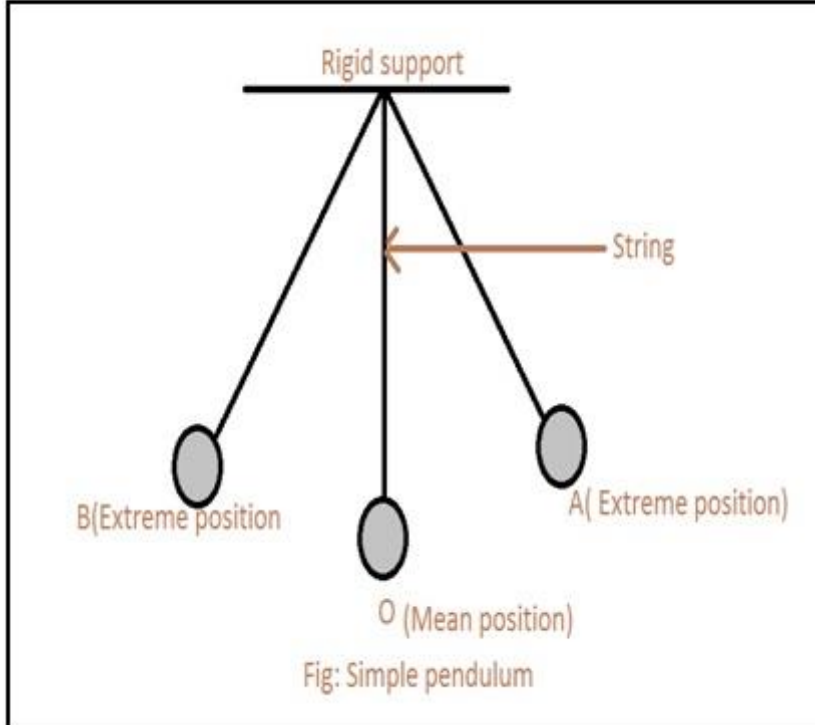
3. a. What do you mean by average speed of an object? How can you find it?

b. A car covers 20 km in 1st hour of his journey, 40 km in next hour and 30 km in 3rd hour. Calculate the average speed.

[Hint-An object seldom moves with a constant speed. Therefore, we calculate speed by dividing total distance travelled by the object with the total time taken. This is the average speed of that object.

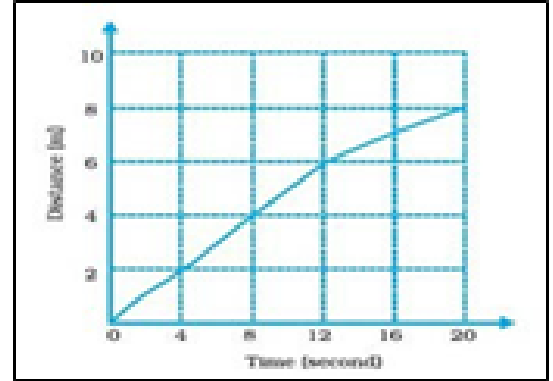
Average speed = Total distance covered/Total time taken,
30 km/h]

4. Draw a neat diagram of a simple pendulum showing its mean and extreme positions.



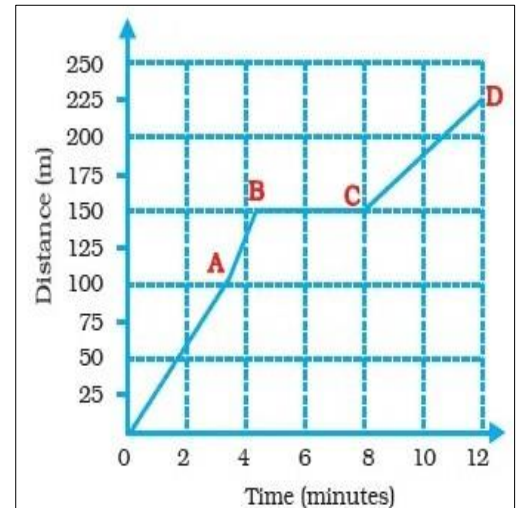
5. Given alongside is the distance-time graph of the motion of an object.

- i) What will be the position of the object at 20s? [8m from the starting point]
- ii) What will be the distance travelled by the object in 12s? [6m]
- iii) What is the average speed of the object? [$8/20=0.4\text{m/s}$]



6. Boojho goes to the football ground to play football. The distance time graph of his journey from his home to the ground is given below-

- i) What does the graph between point B and C indicate about the motion of Boojho?
[Since B and C are parallel to time axis, it indicates that he is at rest i.e., his speed is zero.]
- ii) Is the motion between 0 to 4 minutes uniform or non-uniform?
[Since the graph is not a straight line, it is non-uniform]
- iii) What is his speed between 8 and 12 minutes of his journey?
[Speed = distance/time = $225 - 150 / 12 - 8 = 75/4 = 18.75$ m/min]



V. LONG ANSWER TYPE QUESTIONS. (5M)

1. Write down the steps in constructing a Distance-Time graph.

Scale-

X axis- 1 min=1 cm

Y axis- 1 km=1 cm

[Hint-A distance-Time graph is usually drawn as a line graph as it takes two variable quantities – distance and time. In a distance-time graph, distance is considered on the Y-axis (vertical) and time is considered on the X-axis (horizontal).

i) Draw two perpendicular lines on a graph paper representing the X-axis and the Y-axis.

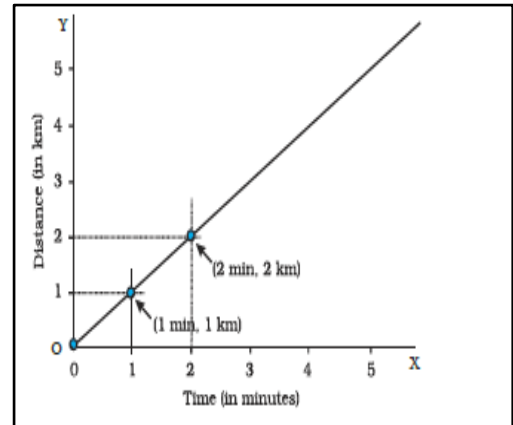
ii) The point of intersection of both axis is known as the point of origin.

iii) Put time on X-axis and distance on the Y-axis.

iv) Select suitable scales to represent the required quantities on both the axes.

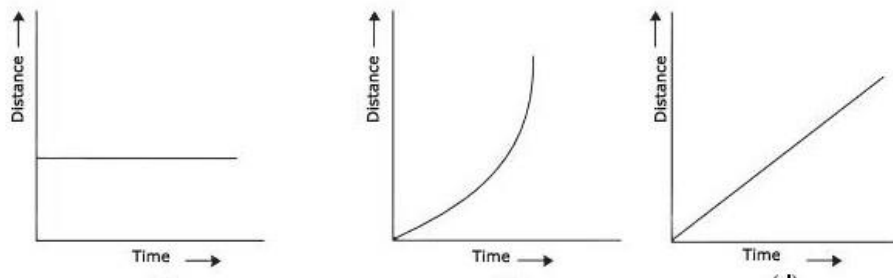
v) Plot points corresponding to each value on both the axes for time and distance covered.

vi) Join all the points to obtain a line graph]



2. a. What is the advantage of distance-time graph?

b. What do the following graphs indicate?



a. [Hint-Distance-time graphs give information about the nature of the motion of an Object like uniform or uniform motion. Motion of an object can be represented by its distance-time graphs.]

b. [Hint- i) If the distance-time graph of an object is a horizontal line parallel to time-axis, then the speed of object is zero. The object is not moving. It is stationary. The object is at rest.

ii) If the distance-time graph of an object is not a straight line (curved line), then its speed is not constant. The speed is changing. The object is in **non-uniform motion**.

iii) If the distance-time graph of an object is a straight line, then it is moving with constant speed and the object is in uniform motion.]

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