



INDIAN SCHOOL AL WADI AL KABIR



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| Class: VII | DEPARTMENT: SCIENCE 2022-2023 | Date: 11.09.2022 |
| 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. Define motion.
[Hint: A body is said to be in motion if it changes its position with respect to its surroundings in a given time.]
2. Define speed. What is its basic unit?
[Hint: The distance covered 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. 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.]
5. Name any two time - measuring devices used in ancient times.
[Hint: Sundial and Sand clock.]
6. Write the formula for calculating speed.
[Hint- $\text{Speed} = \text{Distance}/\text{Time}$]
7. Classify the following as rectilinear, circular or oscillatory motion.
a. Motion of a child in a merry-go-round. b. Bullock cart moving on straight road.
[Hint: a. Motion of a child in a merry-go-round-circular motion.
b. Bullock cart moving on straight road- rectilinear motion.]
8. Mention any two types of graphical representation of information.
[Hint: Pie chart and line graph.]
9. What is called the bob of the pendulum?
[Hint: The metallic ball of a simple pendulum suspended from a rigid stand by a thread.]
10. How can we say that the speed of an object is faster than the other?
[Hint: An object can be said to have a faster speed if it covers longer distance than the other, during a given period of time.]

For question numbers 11 to 13, 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 the 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:

Read the passage and answer the questions that follows:

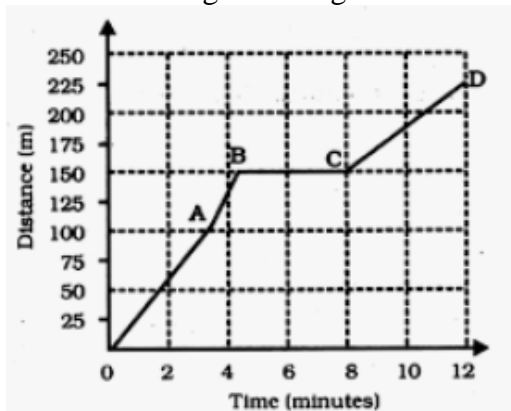
One of the most well-known periodic motions is that of a simple pendulum. A simple pendulum consists of a small metallic ball or a piece of stone suspended from a rigid stand by a thread. The metallic ball is called the bob of the pendulum. The to and fro motion of a simple pendulum is an example of 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. Boojho goes to the ground to play football. The distance-time graph of his journey from his home to the ground is given below in a graph.



- (a) What does the graph between point B and C indicate about the motion of Boojho?
[Hint: Boojho is at rest; his speed is zero.]
 - (b) Is the motion between 0 to 4 minutes uniform or non - uniform?
[Hint: Motion between time 0 to 4 min is non-uniform.]
 - (c) What is his speed between 8 and 12 minutes of his journey?
[Hint: Speed = Distance/Time = 75/4 = 18.75 m/min.]
2. While going for a school picnic, Paheli decided to note the reading on the meters on dashboard of the bus after every 30 minutes till the end of the journey. The speedometer recorded the speed directly. The odometer reads 2552 km initially. After 30 minutes the odometer reads 2574 km. On reaching the destination after one hour, the odometer reads 2605 km.
- (a) What is an odometer?
[Hint: Odometer is the device used to measure distance moved by the vehicle.]
 - (b) Find the distance covered by the bus in the first 30 minutes?
[Hint: 2574 – 2552 = 22 km]
 - (c) What is the unit by which the speedometer records speed?
[Hint: km/h]

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

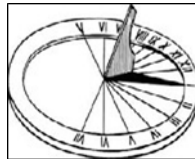
1. What do you mean by average speed of an object? How can you find it?
[Hint-The average speed of an object is the total distance travelled by the object divided by the total time taken to cover that distance.]

Average speed = Total distance covered/Total time taken]

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

**[Hint: Average speed = Total distance covered/Total time taken
= 90/3 = 30 km/h]**

3. What devices are used in vehicles to record speed and distance?
[Hint: Speedometer is used to record speed of the vehicle in km/h and odometer is used to record the distance covered in km.]
4. What do you mean by an oscillatory motion? Give an example.
[Hint: The to and fro motion of a body about its fixed position is called an oscillatory motion. Example - Motion of a simple pendulum.]
5. What are quartz clocks? Write its advantage.
[Hint- Quartz clock is a special type of clock or watch which have an electric circuit with one or more cells. It gives more accurate time.]
6. Identify the time measuring device given below. What was the principle behind working of the device?



[Hint: The given time measuring device is a sundial. It works on the principle that as the position of the sun in the sky changes, the position and length of the shadow cast by the object changes.]

7. A simple pendulum takes 35s to complete 20 oscillations. What is the time period of the pendulum?

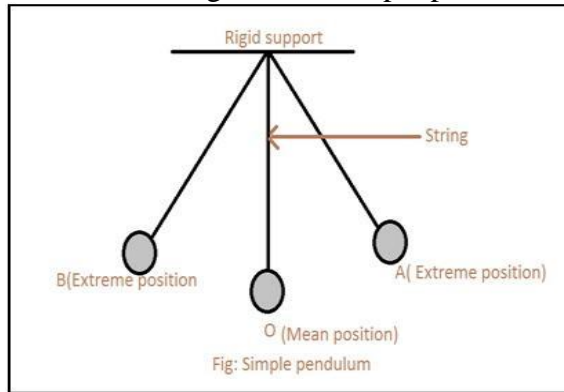
**[Hint-Time period=Total time taken/No: of oscillations
35/20 = 1.75s]**

IV. b) SHORT ANSWER TYPE QUESTIONS (3 M)

1. Distinguish between uniform and non-uniform motion with examples.

[Hint-If a body covers equal distances in equal intervals of time, then the motion is said to be uniform. Example-Hands of a clock. If a body covers unequal distances in equal intervals of time, then its motion is called non-uniform motion. Example -Motion of a car in city traffic]

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



3. Differentiate circular and rotational motion with examples.

[Hint: 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.]

4. Write down the definitions for a day, a month and an year in ancient period.

[Hint: Day – Time between two sunrises. Month - Time interval between one new moon and the next. Year - Time taken by the earth to complete one revolution around the sun.]

5. A train is running at a speed of 45 km/h. How long will it take to reach Lucknow from Delhi when the distance between two stations is 315 km?

[Hint: Speed of the train = 45 km/h.

Distance to be covered = 315 km.

**Time taken = Distance/Speed
= 315/45 = 7 h]**

6. 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: Speed of the bus = 480/8 = 60 km/h.

Speed of the train = 1200/10 = 120 km/h.

Speed of the car is 60km/h whereas the speed of the train is 120km/h. So the train travels faster.]

7. A spaceship travels 36,000 km in one hour. Express its speed in m/s.

[Hint: 36,000 x 5/18 = 10,000 m/s.]

8. A truck moves with the speed of 25 km/h for 10 hours. Calculate the distance covered.

[Hint: Speed of the truck = 25 km/h.

Time taken = 10 h.

**Distance covered = Speed x Time
= 25 x 10 = 250 km.]**

V. LONG ANSWER TYPE QUESTIONS (5 M):

1. Explain different types of motion with examples.

[Hint: i) The type of motion in which objects move along a straight line is known as

rectilinear motion. Example- Soldiers in a march past.

ii)The type of motion in which objects move along a circular path is known as circular motion. Example- Pedal of a bicycle in motion.

iii)The type of circular motion where an object spins on its own axis is called rotational motion. Example- Rotation of earth on its axis.

iv)The type of motion where the object repeats its motion after a fixed interval of time is called periodic motion. Example- Revolution of moon around the earth.

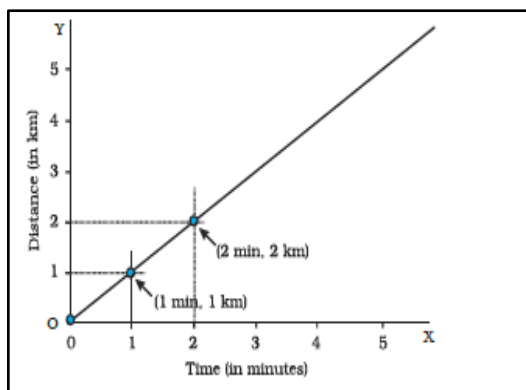
v) The to and fro motion of the body about its fixed position is called oscillatory motion. Example – Pendulum of a clock.]

2. Describe 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 taken on the Y- axis (vertical) and time is taken 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 axes is known as the point of origin.

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

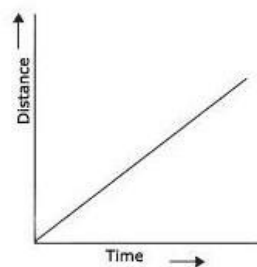
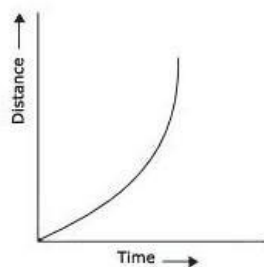
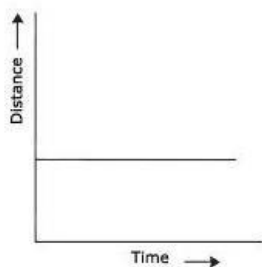
iv)Select suitable scales to represent the required quantities on both the axes.

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.]

3. 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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| PREPARED BY:MS. NEENA ALEX | CHECKED BY: HOD-SCIENCE |
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