



INDIAN SCHOOL AL WADI AL KABIR



CLASS: VII	DEPARTMENT: SCIENCE 2024-2025	DATE: 04/09/2024
WORKSHEET NO.: 6	TOPIC: MOTION AND TIME	NOTE: A4 FILE FORMAT
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO.

I. OBJECTIVE-TYPE QUESTIONS

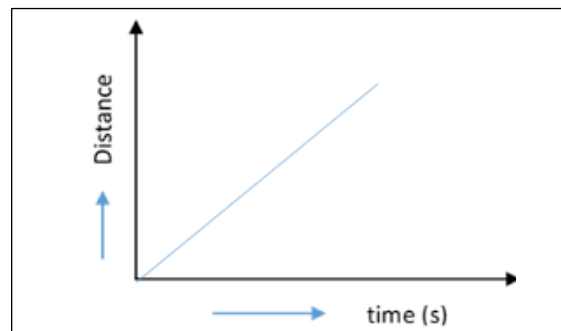
- 1) Which among the following is an **incorrect** statement?
 - a) The speed of an object can be measured using a speedometer.
 - b) Time can be measured using a stopwatch.
 - c) The speed of an object can be measured using a stopwatch.**
 - d) Time can be measured using a clock.

- 2) The movement of a potter's wheel is an example of:
 - a) Periodic motion
 - b) Rectilinear motion
 - c) Circular motion
 - d) Both a and c**

- 3) Time period is :
 - a) Total time taken/No of oscillations**
 - b) No: of oscillations/Time taken
 - c) Distance/Time
 - d) Distance/No: of oscillations

- 4) 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

- 5) The distance-time graph of a bus is shown below.



Which of these statements is true for the speed of the vehicle?

- a) It has a non-uniform speed as distance and time are increasing non-uniformly
- b) It has a uniform speed as the speed of the vehicle keeps on changing
- c) It has a non-uniform speed as time and distance both are decreasing

d) It has a uniform speed as time and distance both are increasing uniformly

- 6) What is the time period of a pendulum that completes five oscillations in 10 seconds?
- a) 5s
 - b) 1s
 - c) 10s
 - d) 2s**

For the following questions, 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.

7. **Assertion (A):** The speed of an object can be calculated using the formula
 $\text{Speed} = \text{Distance} / \text{Time}$.

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

8. **Assertion (A):** An object moving with a constant speed is said to be in uniform motion.

Reason (R): The object covers an equal distance in an equal interval of time.

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

9. **Assertion (A):** A faster-moving object covers more distance in less time.

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

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

10. **Assertion (A):** The speedometer records the speed of the vehicle generally in km/hr.

Reason (R): Odometer measures the time taken by the vehicle for one kilometer.

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

II. VERY SHORT QUESTIONS (2M):

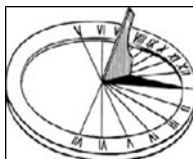
- 1.a) What are quartz clocks? Give its advantages.

[Hint- A 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.]

- b) A bus covers 60 km in the 1st hour of its journey, 10 km in the next hour, and 20 km in 3rd hour. Calculate the average speed.

**[Hint: Average speed = Total distance covered/Total time taken
 $(60+10+20)/3$
 $= 90/3 = 30 \text{ km/h}$]**

2. a) 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.]

- b) Name any two time-measuring devices used in ancient times.

[Hint: Sundial and Sand clock.]

- c) State one limitation of the sundial.

[Hint: It does not work during a cloudy day and at night]

- 3a) 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.]

- b) Classify the following as rectilinear, circular, or oscillatory motion.

- i. A child skipping on a rope. ii. Child playing on a straight slide in a park.

[Hint: i. A child skipping on a rope-circular motion.

ii. Child playing on a straight slide in a park- rectilinear motion.]

- 4) What is the average speed of an object? How can you find it?

[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]

- 5) What devices are used in vehicles to record speed and distance?

[Hint: The speedometer is used to record the speed of the vehicle in km/h and the odometer is used to record the distance covered in km]

- 6.a) A simple pendulum takes 40 s to complete 15 oscillations. Calculate the time period?

**[Hint-Time period=Total time taken/No: of oscillations
 $40/15 = 2.67 \text{ s}$]**

- b) 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.]

7. a) Define speed. What is its basic unit?

[Hint: The distance covered by an object in unit time is called speed.

Its basic unit is meter per second (m/s).]

- b) Write the formula for calculating speed.

[Hint- Speed = Distance/Time]

- c) 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 a longer distance than the other, during a given period of time.]

III. SHORT ANSWER TYPE QUESTIONS: (3M)

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

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

2. 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.]

3. A car is moving at a speed of 50 km/h. How long will it take to reach Rajasthan from Delhi when the distance between the two stations is 450 km?

**[Ans: Speed of the car = 50 km/h.
Distance to be covered = 450 km.
Time taken = Distance/Speed
= 450/50 = 9h]**

4. 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]

5. The distance between two metro stations is 150 km. A train takes 2 hours to cover this distance. Calculate the speed of the train.

**Ans. Distance between two stations = 150 km
Time taken to cover these distances = 2 hours
Speed = Distance/Time
= 150 / 2
= 75 km/h**

6. a) 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.]

- b) A rocket travels at a speed of 15,000 m/s. Express this speed in km/h.

**Ans. Speed of rocket in m/s = 15,000
Speed of rocket in km/h = 15,000 x 18/5
= 3,000 x 18**

$$= 54,000 \text{ km/h}$$

c) A train moves at a speed of 162 km/h. Express this speed in m/s.

Ans. Speed of train in km/h = 162

$$\text{Speed of train in m/s} = 162 \times \frac{5}{18}$$

$$= 9 \times 5$$

$$= 45 \text{ m/s}$$

7. 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.

$$\text{Distance covered} = \text{Speed} \times \text{Time}$$

$$= 25 \times 10 = 250 \text{ km.}]$$

IV. LONG ANSWER TYPE QUESTIONS. (5M)

1. Define i) Rectilinear motion ii) Circular motion iii) Rotational motion iv) Periodic motion and v) Oscillatory 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 the moon around the earth.

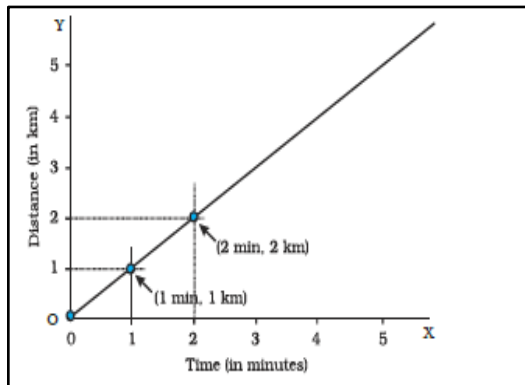
v) The to and fro motion of the body about its fixed position is called oscillatory motion. Example – Pendulum of a clock.]

2. a) 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 the X-axis and distance on the Y-axis.

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

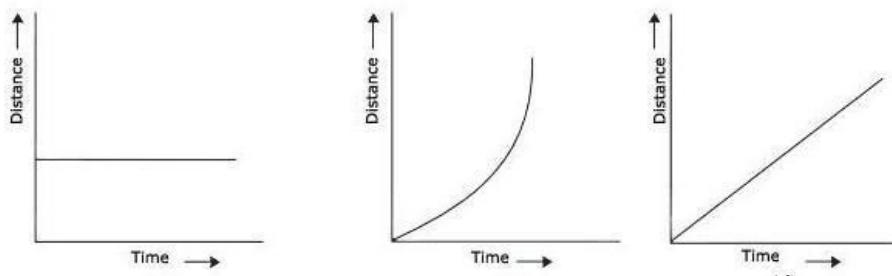
v) Plot points corresponding to each value on both the axes for time and distance covered.

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

b) Mention any two types of graphical representation of information.

[Hint: Pie chart and line graph.]

3. a) What is the advantage of the distance-time graph?
b) Draw the distance-time graph for i) object at rest ii) object in non-uniform motion iii) object in uniform motion. Explain the graph.
a) **Hint: [Distance-time graphs give information about the nature of the motion of an object like uniform or non-uniform motion. Motion of an object can be represented by its distance-time graphs.]**
b)



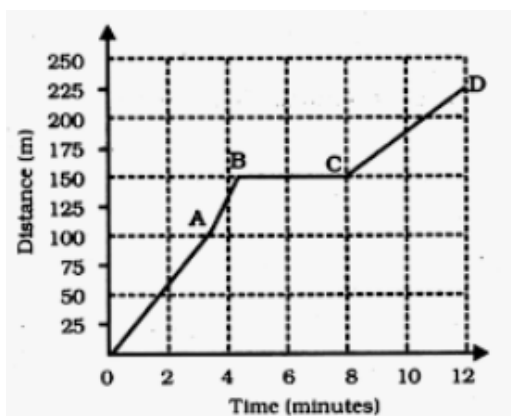
i) If the distance-time graph of an object is a horizontal line parallel to the time-axis, then the speed of object is zero. The object is not moving. It is stationary. The object is at rest.

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.]

V. SOURCE-BASED/ CASE STUDY-BASED QUESTIONS

1. Boojho was very happy as he got selected for the athletics team of his school. He started his training from the next day onwards. The distance-time graph shows the distance covered by him at each minute of his practice.



- (a) What is the speed of Boojho from B to C?
[Hint: Boojho is at rest; his speed is zero.]
- (b) When did Boojho have a non-uniform speed?
[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 = $(225-150)/4 = 75/4 = 18.75$ m/min.]
2. Paheli found that a car's odometer reads 24,500km at the start of the trip. After driving for 2 hours, the odometer reads 24,830km. She has studied that an odometer is a device used to measure the distance covered by moving objects. The car was moving at a constant speed.
- (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 car in 2hrs.
[Hint: $24,830 - 24,500 = 330$ km]
- (c) Find the speed of the car.
[Hint: Speed=Distance/Time= $330/2=165$ km/h]

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