St. Andrews Scots School

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Session: 2026 – 2027
(Answer Key)

Class: VII	Subject: Science	Chapter: Measurement of Time and Motion

Self-Assessment: **Page No. 103**

A. Multiple Choice Questions:

1. (b) 2. (c) 3. (c) 4. (c)

B. Assertion-Reason Based Questions:

1. (d) 2. (a) 3. (c)

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A. Multiple Choice Questions:

1. (c) 2. (c) 3. (b) 4. (a) 5. (c)

B. Assertion-Reason Based Questions:

1. (c) 2. (d)

Exercise
Section-A

A. Oral Questions:

1. Ancient people told time by observing the Sun's movement and shadows using devices like sundials, water clocks, hourglasses and ghatika-yantra before clocks were invented.
2. Oscillatory motion is the back-and-forth movement of an object about a fixed point at regular intervals, like the motion of a simple pendulum.
3. A stopwatch is more useful than a clock for sports events because it can measure short time intervals accurately, even up to fractions of a second, while an ordinary clock cannot.

B. Multiple Choice Questions:

1. (d) 2. (c) 3. (c) 4. (b) 5. (c) 6. (c)

C. Assertion-Reason based Questions:

1. (c) 2. (d) 3. (a)

D. Case-Based Questions:

Case-I

1. Aarav is faster.
2. Mahi's speed = Distance ÷ Time = 900 ÷ 10 = 90 m/s
3. Aarav's speed = Distance ÷ Time = 1200 ÷ 8 = 150 m/s

Case-II

1. Scooter A shows uniform motion because it covers equal distances in equal intervals of time.
2. Yes, both can reach the same destination but move differently — Scooter A moves at a constant speed, while Scooter B's speed changes, showing non-uniform motion.

Section-B

A. Very Short Answer Questions:

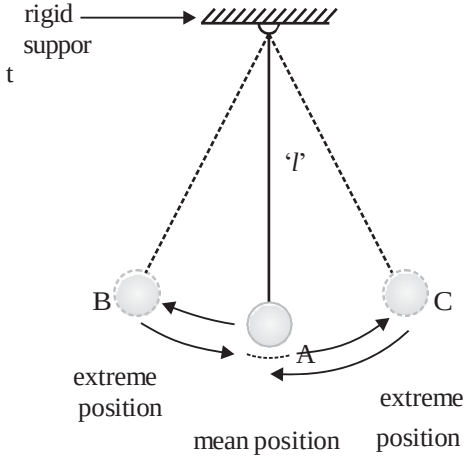
1. Second
2. Second (s)
3. Water clock (Ghatika-yantra)

B. Short Answer Questions:

1. **Average speed** is the total distance travelled divided by the total time taken for the journey. It helps compare overall motion when speed varies.

$$\text{Average Speed} = \frac{\text{Total Distance}}{\text{Time Taken}}$$

2. **One oscillation** of a pendulum means the bob moves **from one extreme** end to the other and back to its starting position.



3. Difference between uniform and non-uniform motion:

Uniform motion	Non-uniform motion
1. Object covers equal distances in equal intervals of time.	Object covers unequal distances in equal intervals of time
2.Speed remains constant.	Speed changes with time.
3.Example: A train moving at constant speed.	Example: A car slowing down in traffic.

C. Long Answer Questions:

1. **Three Ancient Timekeeping Devices:**

(a) Sundial: Used the shadow of the Sun cast by a stick to tell time during the day.

(b) Water Clock: Measured time by the steady dripping of water from one container to another.

(c) Hourglass: Contained sand that flowed from one glass bulb to another, measuring short time intervals.

2. **Working of a Simple Pendulum:**

(a) A simple pendulum consists of a **bob** suspended by a **string** from a fixed point.

(b) When pulled to one side and released, the bob **swings back and forth** around its mean position.

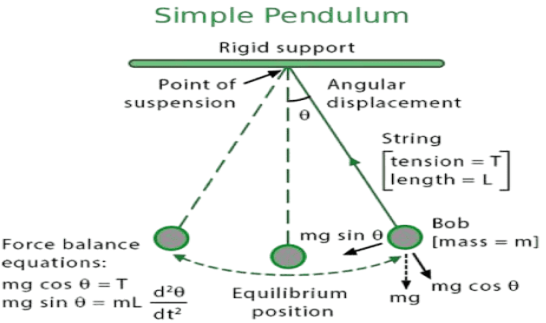
(c) One complete swing is called **one oscillation**.

(d) Factors affecting time period:

i. Length of string – longer pendulum → longer time period.

ii. Acceleration due to gravity – more gravity → shorter time period.

iii. Mass of the bob – no effect.



3. **Formula Triangle for Speed, Distance and Time:**

The relationship between the three quantities is:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}, \quad \text{Distance} = \text{Speed} \times \text{Time}, \quad \text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

Example: If a car covers 150 km in 3 hours,

$$\text{Speed} = 150/3$$
$$= 50 \text{ km/h}$$

D. Application-Based Questions:

1. Given: Speed = 60 km/h, Time = 1.5 h

$$\text{Distance} = \text{Speed} \times \text{Time}$$
$$= 60 \times 1.5 = 90 \text{ km}$$

Answer: The van will cover 90 km.

2. Given: Distance = 24 km, Time = 2 h

Speed = Distance ÷ Time

= 24 ÷ 2 = 12 km/h

Answer: The cyclist's speed is 12 km/h.

3. Given: Distance = 300 km, Speed = 75 km/h

Time = Distance ÷ Speed

= 300 ÷ 75 = 4 hours

Answer: The car will take 4 hours.