UNIQUE STUDY POINT

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Class: VI	**Subject:** Science	**Session:** 2025-26
Chapter: 05 - Measurement of Length and Motion	**Time:** 1½ Hours	**Max. Marks:** 40

General Instructions:

1. All questions are compulsory.
2. This question paper contains 20 questions divided into five sections A, B, C, D and E.
3. Section A contains 10 MCQs of 1 mark each.
4. Section B contains 4 questions of 2 marks each.
5. Section C contains 3 questions of 3 marks each.
6. Section D contains 1 question of 5 marks.
7. Section E contains 2 Case Study Based questions of 4 marks each.

SECTION A - Multiple Choice Questions (1 mark each)

Q1. The SI unit of length is:

(a) centimetre

(b) metre

(c) kilometre

(d) millimetre

Q2. One metre is equal to:

(a) 10 centimetres

(b) 100 centimetres

(c) 1000 centimetres

(d) 10000 centimetres

Q3. Which of the following is NOT a standard unit for measuring length?

(a) metre

(b) kilometre

(c) handspan

(d) centimetre

Q4. The motion of a ceiling fan is an example of:

(a) linear motion

(b) circular motion

(c) oscillatory motion

(d) none of these

Q5. When an object moves to and fro about a fixed position, its motion is called:

(a) circular motion

(b) linear motion

(c) oscillatory motion

(d) random motion

Q6. One kilometre is equal to:
(a) 10 metres
(b) 100 metres
(c) 1000 metres
(d) 10000 metres

Q7. The smallest measurement that can be made using a 15-cm scale is:
(a) 1 cm
(b) 1 mm
(c) 0.5 cm
(d) 0.1 cm

Q8. An object is said to be in motion if its position:
(a) changes with respect to reference point
(b) remains same with respect to reference point
(c) changes with time only
(d) remains fixed

Q9. The motion of a car moving on a straight road is an example of:
(a) circular motion
(b) oscillatory motion
(c) linear motion
(d) periodic motion

Q10. Which measuring device is most suitable for measuring the girth of a tree?
(a) metre scale
(b) measuring tape
(c) 15-cm scale
(d) none of these

SECTION B - Short Answer Questions (2 marks each)

Q11. Why do we need standard units for measurement? Give two reasons.

Q12. Convert the following:
(i) 2.5 km into metres
(ii) 450 cm into metres

Q13. Distinguish between circular motion and oscillatory motion with one example each.

Q14. What is a reference point? Why is it important in describing motion?

SECTION C - Short Answer Questions (3 marks each)

Q15. Explain the correct method of measuring length using a scale. Mention three important precautions.

Q16. How can you measure the length of a curved line? Describe the method in detail.

Q17. A bus is moving on a road. Are the passengers inside the bus at rest or in motion? Explain your answer with proper reasoning.

SECTION D - Long Answer Question (5 marks)

Q18. Explain the three types of motion with suitable examples from your daily life. Draw diagrams wherever necessary.

SECTION E - Case Study Based Questions (4 marks each)

Q19. Case Study 1:

Deepa is travelling from her home to Delhi by bus. She observes kilometre stones on the roadside. She sees the following kilometre stones at different times:

10:00 AM - Delhi 80 km

11:00 AM - Delhi 60 km

12:00 PM - Delhi 40 km

Based on this information, answer the following:

(a) What is the reference point in this case? (1 mark)

(b) How far did the bus travel between 10:00 AM and 11:00 AM? (1 mark)

(c) Is Deepa in motion or at rest with respect to the bus? Explain. (1 mark)

(d) How much more distance does the bus need to cover to reach Delhi at 12:00 PM? (1 mark)

Q20. Case Study 2:

A carpenter is making a wooden box. He needs to cut wooden planks of exact measurements. He has the following tools: a metre scale with broken ends (first 2 cm missing), a measuring tape, a 15-cm scale in good condition, and a piece of thread.

Based on this information, answer the following:

(a) Which tool should he use to measure a 2-metre long plank? (1 mark)

(b) How can he still use the broken metre scale for measurement? (1 mark)

(c) If he needs to measure the curved edge of a decorative piece, which tool would be most suitable? (1 mark)

(d) Why would using handspan not be suitable for this work? (1 mark)

DETAILED ANSWER KEY - PAPER 01

SECTION A - Answers to MCQs

Ans 1. (b) metre

The SI unit of length is metre, represented by the symbol 'm'.

Ans 2. (b) 100 centimetres

1 metre = 100 centimetres

Ans 3. (c) handspan

Handspan is not a standard unit because it varies from person to person.

Ans 4. (b) circular motion

The blades of a ceiling fan move along a circular path, hence it is circular motion.

Ans 5. (c) oscillatory motion

When an object moves to and fro about a fixed position, it is called oscillatory motion.

Ans 6. (c) 1000 metres

1 kilometre = 1000 metres

Ans 7. (b) 1 mm

The smallest division on a 15-cm scale is 1 millimetre (1 mm).

Ans 8. (a) changes with respect to reference point

An object is in motion if its position changes with respect to a reference point with time.

Ans 9. (c) linear motion

A car moving on a straight road follows linear motion.

Ans 10. (b) measuring tape

A flexible measuring tape is most suitable for measuring curved surfaces like the girth of a tree.

SECTION B - Answers to Short Answer Questions

Ans 11. We need standard units for measurement because:

Reason 1: Non-standard units like handspan, foot, etc. vary from person to person, making measurements inconsistent.

Reason 2: Standard units ensure that measurements made by different people are the same and can be understood universally, facilitating clear communication and trade.

Ans 12. Conversions:

(i) 2.5 km = 2.5 × 1000 m = 2500 metres
(ii) 450 cm = 450 ÷ 100 m = 4.5 metres

Ans 13. Difference between circular and oscillatory motion:

Circular Motion: When an object moves along a circular path, it is called circular motion.
Example: Motion of hands of a clock, motion of a merry-go-round.

Oscillatory Motion: When an object moves to and fro about a fixed position, it is called oscillatory motion.
Example: Motion of a swing, motion of a pendulum.

Ans 14. Reference Point:

A reference point is a fixed object or point with respect to which the position or motion of another object is described.

Importance: It is important because motion is always described relative to a reference point. Without a reference point, we cannot determine whether an object is at rest or in motion. For example, passengers in a moving bus are at rest with respect to the bus (reference point) but in motion with respect to trees outside.

SECTION C - Answers to Short Answer Questions

Ans 15. Correct method of measuring length using a scale:

To measure length correctly using a scale, follow these steps:

Precaution 1 - Correct Placement: Place the scale in contact with the object along its length. The scale should lie flat and parallel to the object being measured.

Precaution 2 - Eye Position: Your eye should be directly above the point being measured. Looking from an angle can cause parallax error and give incorrect readings.

Precaution 3 - Using Broken Scale: If the ends of the scale are broken or the zero mark is not clear, start measurement from any other full mark (like 1.0 cm) and subtract this value from the final reading to get the correct length.

Ans 16. Measuring the length of a curved line:

To measure the length of a curved line, we use the following method:

Step 1: Take a flexible measuring tape or a thread.

Step 2: Place the thread carefully along the curved line, ensuring it follows the curve completely without leaving any gaps.

Step 3: Mark the starting and ending points on the thread.

Step 4: Straighten the thread and measure its length using a metre scale or ruler.

Note: The length of the straightened thread gives the length of the curved line. This method is used to measure irregular paths, curved edges, or circumferences.

Ans 17. Motion of passengers inside a moving bus:

The answer depends on the choice of reference point:

With respect to the bus (reference point): The passengers are at rest because their position is not changing with respect to the bus. They remain seated in the same place inside the bus.

With respect to objects outside (reference point): The passengers are in motion because their position is continuously changing with respect to trees, buildings, or other stationary objects outside the bus.

Conclusion: Motion and rest are relative terms. The same passengers can be at rest with one reference point and in motion with another reference point. This shows the importance of clearly defining a reference point when describing motion.

SECTION D - Answer to Long Answer Question

Ans 18. Three types of motion:

There are three main types of motion we observe in our daily life:

1. Linear Motion:
When an object moves along a straight line, its motion is called linear motion.
Examples from daily life:
- A car moving on a straight road
- An apple falling from a tree
- March-past of students in a parade
- A train moving on a straight track
- A ball rolling on a flat surface in one direction

2. Circular Motion:
When an object moves along a circular path, its motion is called circular motion.
Examples from daily life:
- Motion of hands of a clock
- Motion of blades of a ceiling fan
- A merry-go-round in a park
- Motion of Earth around the Sun
- A stone tied to a string and whirled in circles

3. Oscillatory Motion:
When an object moves to and fro about a fixed position, its motion is called oscillatory motion.
Examples from daily life:
- Motion of a swing in a playground
- Motion of a pendulum in a clock
- Motion of a cradle
- Vibration of a guitar string
- Movement of a branch of a tree in the wind

Note: Both circular motion and oscillatory motion are periodic in nature, meaning they repeat their path after a fixed interval of time.

SECTION E - Answers to Case Study Based Questions

Ans 19. Case Study 1 - Answers:

(a) The reference point in this case is **Delhi**. All distances are measured from Delhi, as shown by the kilometre stones.

(b) Between 10:00 AM and 11:00 AM:
Distance covered = 80 km - 60 km = **20 kilometres**

(c) Deepa is **at rest** with respect to the bus. This is because her position inside the bus is not changing. She remains seated in the same place. However, with respect to the kilometre stones or trees outside, she is in motion.

(d) At 12:00 PM, the kilometre stone shows Delhi 40 km. Therefore, the bus needs to cover **40 more kilometres** to reach Delhi.

Ans 20. Case Study 2 - Answers:

(a) For measuring a 2-metre long plank, he should use the **measuring tape** because it can measure longer lengths easily and accurately.

(b) To use the broken metre scale (with first 2 cm missing), he should:

- Start measurement from the 2 cm mark (or any other clear full mark)
- Note the reading at the other end
- Subtract 2 cm from the final reading to get the correct length

For example: If the final reading is 52 cm, then actual length = 52 - 2 = 50 cm

(c) For measuring a curved edge, the most suitable tool would be the **measuring tape** (as it is flexible) or the **piece of thread**. The thread can be placed along the curve and then straightened to measure its length.

(d) Using handspan would not be suitable because:
- Handspan is not a standard unit and varies from person to person
- Carpentry work requires exact and precise measurements
- If different carpenters use their handspans, the measurements will be different
- This would result in poorly fitting joints and unprofessional work

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