GRADE: 7

SUBJECT: Practical Geometry
DURATION: 2½ hrs
MAX MARKS: 80

Instructions:

1. The time given at the head of this Paper is the time allowed for writing the answers.
2. You will not be allowed to write during the first 10 minutes. Use this time to read the question paper carefully.
3. Attempt **all questions from Section A** and **any four questions from Section B**.
4. Use a **compass, ruler, and protractor** where necessary.
5. All constructions must be done accurately and neatly.
6. Omission of essential working will result in loss of marks.

SECTION A (4 × 10 = 40 marks)

(Answer all questions)

1. Choose the correct option:

a) A triangle can be constructed if:
- (i) The sum of any two sides is less than the third side.
- (ii) The sum of any two sides is greater than the third side.
- (iii) The difference between two sides is greater than the third side.
- (iv) Any two angles are equal.

b) To construct a triangle using the **SSS criterion**, we need:
- (i) Three sides
- (ii) Two sides and one angle
- (iii) Two angles and one side
- (iv) One side and one angle

c) The perpendicular bisector of a line segment:
- (i) Passes through the midpoint at any angle

- (ii) Passes through the midpoint at 90°
- (iii) Divides the line into three equal parts
- (iv) Always passes through an endpoint

d) A quadrilateral can be uniquely constructed if we know:
- (i) Three sides and two angles
- (ii) Four sides and one angle
- (iii) Four sides and one diagonal
- (iv) Only three sides

2. Solve the following:

a) Define practical geometry and give two real-life applications.

b) Construct a **right-angled triangle** with hypotenuse **7 cm** and one leg **5 cm**. Write the steps of construction.

c) Using a ruler and compass, construct a **perpendicular bisector** of a line segment **AB = 8 cm** and mark its midpoint.

3. Solve the following constructions:

a) Construct **ΔABC** where **AB = 6 cm, BC = 5 cm, and AC = 4 cm**. Explain the steps.

b) Construct an **isosceles triangle** where the base is **6 cm** and equal sides are **7 cm**.

c) Construct a **parallelogram** with sides **6 cm and 4 cm**, and one angle **60°**.

4. State whether the following statements are TRUE or FALSE:

a) A triangle can always be constructed if we are given three angles.
b) The sum of any two sides of a triangle is always greater than the third side.
c) A quadrilateral with only four sides given is always unique.
d) The bisector of an angle divides it into two equal angles.

5. Solve the following problems:

a) Construct a **triangle ABC** where **AB = 7 cm, BC = 5 cm, and ∠B = 60°**.

b) Draw a **rhombus** with diagonals **8 cm and 6 cm**. Write the steps of construction.

c) Construct a **triangle** with sides **5 cm, 6 cm, and 7 cm**, and then draw the **altitude from the longest side**.

SECTION B (4 × 10 = 40 marks)

(Answer any four questions)

6. Geometry-Based Questions:

a) Construct a **scalene triangle** with sides **5 cm, 7 cm, and 8 cm**.

b) Using a compass and ruler, construct a **60° angle** without using a protractor.

c) Construct a **kite** with diagonals **7 cm and 5 cm**.

7. Construction of Quadrilaterals:

a) Construct a **square** with side **6 cm**.

b) Construct a **rectangle** with length **7 cm** and breadth **4 cm**.

c) Construct a **trapezium** where one parallel side is **8 cm**, the other is **5 cm**, and the height is **4 cm**.

8. Real-Life Applications of Practical Geometry:

a) A road map shows three cities forming a **triangle** with distances **7 km, 8 km, and 10 km**. Construct this triangle using a scale of **1 cm = 1 km**.

b) An engineer needs to construct a **bridge support** in the shape of a **parallelogram** with sides **12 m and 8 m** and an angle **75°**. Draw the parallelogram using a scale of **1 cm = 2 m**.

c) A school playground is in the shape of a **trapezium** with bases **12 m and 8 m**, and height **6 m**. Draw its diagram using a scale of **1 cm = 2 m**.

9. Higher Order Thinking Skills (HOTS):

a) Given a **triangle ABC**, construct a **median from A** to **BC**.

b) Construct a **rhombus** with a side of **5 cm** and one diagonal **8 cm**.

c) A garden is shaped like a **quadrilateral** with sides **6 cm, 5 cm, 4 cm, and 7 cm**. Construct the quadrilateral and measure one of its diagonals.

10. Bonus Challenge Questions:

a) A **pentagon** has all its sides equal to **6 cm**. Construct it using a ruler and compass.

b) A **hexagon** has all its sides equal to **5 cm**. Construct it accurately using only a ruler and compass.

c) A **triangle has two equal sides of 6 cm each and an included angle of 45°**. Construct this triangle and measure the third side.

END OF THE QUESTION PAPER