PRACTICE PAPER

ICSE CLASS 10 – MATHEMATICS

Chapter 19 : Constructions (Circles)

(Geometry : Tangents, Circumcircle and Incircle Constructions)

Maximum Marks: 40 ***Time allowed: One and a half hours***

1. *Answers to this Paper must be written on the paper provided separately.*
2. *You will not be allowed to write during the first 10 minutes. This time is to be spent in reading the question paper.*
3. ***The time given at the head of this Paper is the time allowed for writing the answers.***
4. *Attempt* ***all*** *questions from* ***Section A*** *and* ***any two*** *questions from* ***Section B****.*
5. ***All working, including rough work, must be clearly shown, and must be done on the same sheet as the rest of the answer.***
6. ***Omission of essential working will result in loss of marks.***
7. *The intended marks for questions or parts of questions are given in brackets [ ].*
8. *Constructions are to be done with ruler and compasses only; all construction lines and arcs must be shown. Figures given in the questions are rough sketches and are not drawn to scale.*

Question 1

Choose the correct answers to the questions from the given options. [8]

(Do not copy the question, write the correct answers only.)

(i) A point P is 13 cm away from the centre of a circle of radius 5 cm. The length of the tangent drawn from P to the circle is:

(a) 8 cm
(b) 10 cm
(c) 12 cm
(d) 17 cm

(ii) The circumcentre of a triangle is the point of intersection of its:

(a) perpendicular bisectors of the sides
(b) medians
(c) altitudes
(d) bisectors of the angles

(iii) The incentre of a triangle is equidistant from:

(a) the three vertices
(b) the three sides
(c) the mid-points of the sides
(d) two of the vertices only

(iv) The radius of the circle circumscribing a regular hexagon of side 5 cm is:

(a) 2.5 cm
(b) 10 cm
(c) $5\sqrt{3}$ cm
(d) 5 cm

(v) The angle between two tangents to a circle is 50°. The angle between the radii drawn to the two points of contact is:

(a) 50°
(b) 130°
(c) 100°
(d) 65°

(vi) The circumcentre of a right-angled triangle lies at:

(a) the vertex of the right angle
(b) the centroid of the triangle
(c) the foot of the altitude from the right angle
(d) the mid-point of the hypotenuse

(vii) **Assertion (A):** To draw a tangent at a point P of a circle with centre O, a line is drawn through P perpendicular to OP.

Reason (R): A tangent to a circle is perpendicular to the radius drawn to the point of contact.

(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true, and (R) is the correct explanation for (A).
(d) Both (A) and (R) are true, but (R) is not the correct explanation for (A).

(viii) **Assertion (A):** The circumcentre of an obtuse-angled triangle lies inside the triangle.

Reason (R): The circumcentre of a triangle is equidistant from its three vertices.

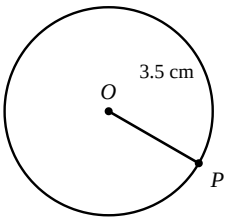
(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true, and (R) is the correct explanation for (A).
(d) Both (A) and (R) are true, but (R) is not the correct explanation for (A).

Question 2

(i) The sides of a triangle are 9 cm, 12 cm and 15 cm. Find the radius of its circumscribed circle and the radius of its inscribed circle. [4]

(ii) The angle between the two tangents drawn to a circle of radius 4 cm from an external point P is 60°. Find the angle between the radii drawn to the points of contact, the distance of P from the centre, and the length of each tangent. [4]

(iii) Using ruler and compasses only, draw a circle of radius 3.5 cm with centre O. Mark a point P on the circle and construct the tangent to the circle at P (a rough sketch is shown). [4]

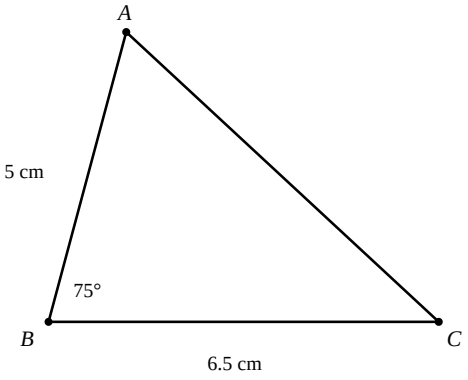


SECTION B (20 Marks)

*(Attempt **any two** questions from this Section.)*

Question 3

Using ruler and compasses only, construct ΔABC in which AB = 5 cm, BC = 6.5 cm and ∠ABC = 75° (a rough sketch is shown).



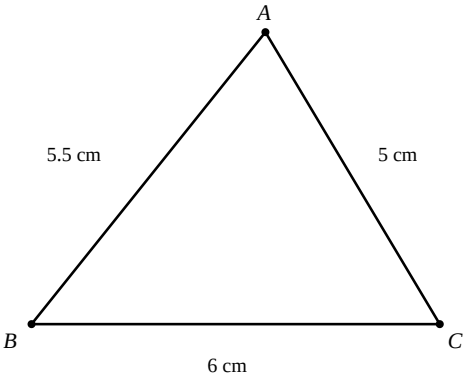
(i) Construct the triangle ABC. [3]

(ii) Construct the circumcircle of the triangle and measure its radius. [3]

(iii) Mark the point D on the circumcircle, on the opposite side of BC from A, such that DB = DC. Join BD and CD, measure ∠BDC and state how it is related to ∠BAC. [4]

Question 4

Using ruler and compasses only, construct ΔABC in which AB = 5.5 cm, BC = 6 cm and CA = 5 cm (a rough sketch is shown).



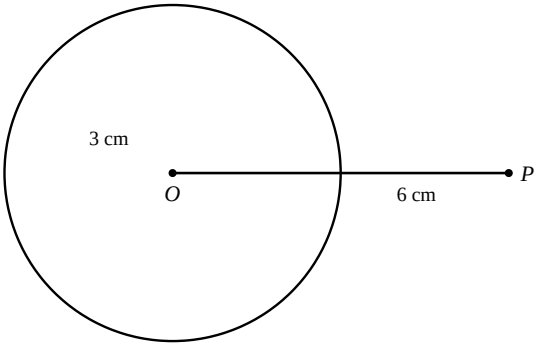
(i) Construct the triangle ABC. [3]

(ii) Construct the incircle of the triangle. [3]

(iii) Measure the radius of the incircle. If the incircle touches BC at D, measure BD and verify that BD = s − AC, where s is the semi-perimeter. [4]

Question 5

Draw a circle with centre O and radius 3 cm. Mark a point P such that OP = 6 cm (a rough sketch is shown).



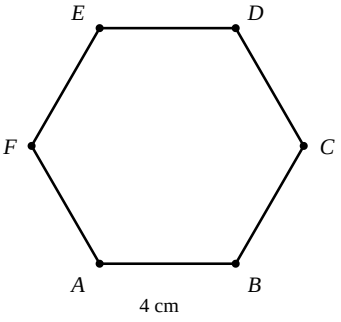
(i) Construct the circle and mark the point P. [3]

(ii) Construct the two tangents PA and PB from P to the circle. [3]

(iii) Measure PA. Using right-angled ΔOAP, find ∠APB and hence name the type of ΔPAB. [4]

Question 6

Using ruler and compasses only, construct a regular hexagon ABCDEF of side 4 cm (a rough sketch is shown).



(i) Construct the regular hexagon ABCDEF. [3]

(ii) Construct the circle which circumscribes the hexagon and state its radius. [3]

(iii) Construct the circle inscribed in the hexagon, measure its radius and verify the measurement by calculation. [4]

— End of Question Paper —