CLASS IX – MATHEMATICS

Chapter Test: I'm Up and Down, and Round and Round (Circles)

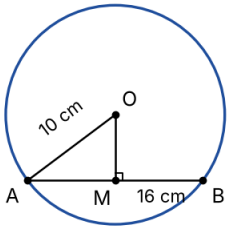
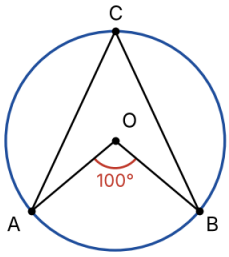
(Ganita Manjari, Grade 9, Part I – Chapter 5)

Time: 1½ Hours **M. M.: 40**

General Instructions:

1. This paper contains 21 questions. All questions are compulsory.
2. This paper is divided into 5 sections: **A, B, C, D** and **E**.
3. In **Section A**, Questions no. **1** to **10** are MCQs and questions no. **11** and **12** are Assertion-Reason based questions of 1 mark each.
4. In **Section B**, Questions no. **13** to **16** are Very Short Answer type questions carrying 2 marks each.
5. In **Section C**, Questions no. **17** and **18** are Short Answer type questions carrying 3 marks each.
6. In **Section D**, Questions no. **19** and **20** are Long Answer type questions carrying 5 marks each.
7. In **Section E**, Question no. **21** is a case based question carrying 4 marks. Internal choice is provided in the 2 marks part of the case study.
8. There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D and 1 part of Section E.
9. Figures are not drawn to scale. Give reasons for your steps wherever required.
10. Use of calculator is **not** allowed.

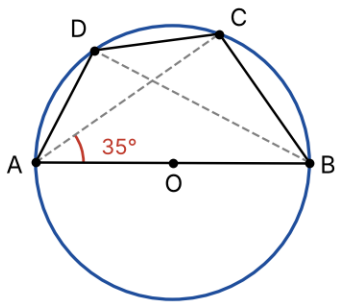
Q. No.	Section – A	Marks
1.	A chord of length 48 cm is drawn in a circle of diameter 50 cm. The distance of the chord from the centre is (A) 9 cm (B) 7 cm (C) 14 cm (D) 24 cm	**[1]**
2.	The radius of a circle is 6.5 cm. The length of the longest chord of the circle is (A) 6.5 cm (B) 10 cm (C) 13 cm (D) 26 cm	**[1]**
3.	An arc of a circle subtends an angle of 130° at the centre. The angle subtended by the arc at a point on the remaining part of the circle is (A) 65° (B) 130° (C) 260° (D) 32.5°	**[1]**
4.	PQ is a diameter of a circle and R is any other point on the circle. Then ∠PRQ is equal to (A) 180° (B) 90° (C) 60° (D) 45°	**[1]**
5.	ABCD is a cyclic quadrilateral in which ∠B = 110°. Then ∠D is equal to (A) 110° (B) 90° (C) 180° (D) 70°	**[1]**
6.	The circumcentre of a right-angled triangle lies at (A) the vertex of the right angle (B) a point outside the triangle (C) the midpoint of the hypotenuse (D) the midpoint of the shortest side	**[1]**
7.	The number of circles that can be drawn through two given points is (A) exactly one (B) exactly two (C) none (D) infinitely many	**[1]**

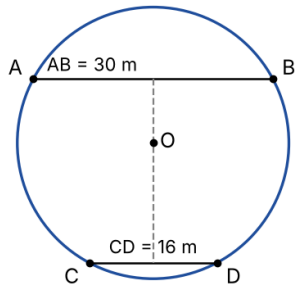
Q. No.	Section – A	Marks
8.	In the figure, O is the centre of the circle, OA = 10 cm and the chord AB = 16 cm. The perpendicular distance of AB from O is  (A) 4 cm (B) 6 cm (C) 8 cm (D) 12 cm	**[1]**
9.	In the figure, O is the centre of the circle, ∠AOB = 100° and C is a point on the major arc AB. Then ∠ACB is  (A) 100° (B) 200° (C) 25° (D) 50°	**[1]**
10.	Of two chords of a circle, the longer chord is (A) nearer to the centre (B) farther from the centre (C) at the same distance from the centre (D) none of these	**[1]**
	Questions number 11 and 12 are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer from the options (A), (B), (C) and (D) as given below. (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A). (C) Assertion (A) is true but Reason (R) is false. (D) Assertion (A) is false but Reason (R) is true.	
11.	**Assertion (A):** A circle can be drawn through any three points in a plane. **Reason (R):** Through three non-collinear points there passes exactly one circle.	**[1]**
12.	**Assertion (A):** Two chords of a circle having the same length are at the same distance from the centre. **Reason (R):** The diameter is the longest chord of a circle.	**[1]**

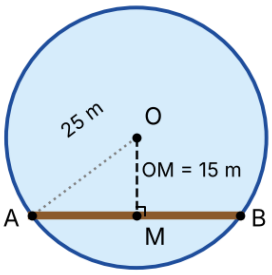
Q. No.	Section – B	Marks
13.	A chord of a circle of radius 29 cm is at a distance of 20 cm from the centre. Find the length of the chord.	**[2]**

Q. No.	Section – B	Marks
14.	(A) An arc of a circle subtends an angle of 124° at the centre. Find the angle subtended by the arc at a point on the remaining part of the circle. **OR** (B) In a circle with centre O and radius 9 cm, chord AB subtends an angle of 60° at the centre. Find the length of the chord AB. Give a reason.	**[2]**
15.	ABCD is a cyclic quadrilateral in which ∠A = (3x + 5)° and ∠C = (2x + 15)°. Find the value of x and the measures of ∠A and ∠C.	**[2]**
16.	(A) MN is a diameter of a circle and P is a point on the circle. If ∠PMN = 35°, find ∠MPN and ∠PNM. **OR** (B) A chord of length 18 cm is at a distance of 12 cm from the centre of a circle. Find the radius of the circle.	**[2]**

Q. No.	Section – C	Marks
17.	(A) Two parallel chords AB and CD of a circle with centre O have lengths 24 cm and 10 cm and lie on opposite sides of the centre. The radius of the circle is 13 cm. Find the distance between the two chords. **OR** (B) ABCD is a cyclic quadrilateral in which ∠A = 65° and ∠B = 85°. Find ∠C and ∠D. If the side DC is extended to a point E, find ∠BCE.	**[3]**
18.	(A) Prove that chords of a circle that are equidistant from the centre are equal in length. **OR** (B) Prove that the angle in a semicircle is a right angle.	**[3]**

Q. No.	Section – D	Marks
19.	(A) In the figure, AB is a diameter of the circle with centre O, and ABCD is a cyclic quadrilateral. ∠CAB = 35°. Find (i) ∠ACB, (ii) ∠ABC, (iii) ∠ADC, (iv) ∠BDC, (v) ∠AOC.  **OR** (B) Prove that the sum of the opposite angles of a cyclic quadrilateral is 180°.	**[5]**

Q. No.	Section – D	Marks
20.	(A) A circular park has a radius of 17 m. Two straight paths AB and CD are the chords of the park, as shown. AB = 30 m and CD = 16 m, and the paths are parallel and on opposite sides of the centre O.  (i) Find the distance of AB from the centre. [2] (ii) Find the distance of CD from the centre. [1] (iii) Which path is nearer to the centre? Which theorem about chords does this illustrate? [1] (iv) Find the distance between the two paths. [1] **OR** (B) (i) ABC is a right-angled triangle with ∠B = 90°, AB = 6 cm and BC = 8 cm. Find the position of its circumcentre and the radius of its circumcircle. [2] (ii) In ΔPQR, PQ = PR = 10 cm and QR = 12 cm. Find the radius of its circumcircle. [3]	**[5]**

Q. No.	Section – E	Marks
21.	**Case Study:** A circular pond of radius 25 m is in the middle of a park. A straight wooden bridge AB is built across the pond, with its ends A and B on the edge of the pond. The perpendicular distance of the bridge AB from the centre O of the pond is 15 m. A second straight bridge CD, 30 m long, is also built across the pond. Pond (not to scale)  (i) Find the length of the bridge AB. **[1]** (ii) Find the distance of the bridge CD from the centre O. **[1]** (iii) (A) If the two bridges are parallel and on opposite sides of the centre, find the distance between them. **[2]** **OR** (iii) (B) If the two bridges are parallel and on the same side of the centre, find the distance between them. **[2]**	**[4]**