

SEMESTER-TWO

MATHEMATICS

Class XI

Sample Paper—2

Max. Marks: 50

Time Allowed: 90 minutes

General Instructions:

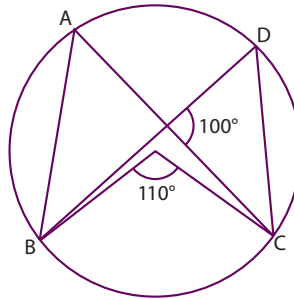
- (i) This question paper consists of 45 questions in 5 sections.
- (ii) All questions are compulsory.
- (iii) Section A consists of 10 Multiple Choice Questions carrying 01 mark each.
- (iv) Section B consists of 10 Fill in the Blanks Type Questions carrying 01 mark each.
- (v) Section C consists of 10 True or False Statement Type Questions carrying 01 mark each.
- (vi) Section D consists of 10 Very Short Answer Type Questions carrying 01 marks each.
- (vii) Section E consists of 5 Short Answer Type Questions carrying 02 marks each.

Section A

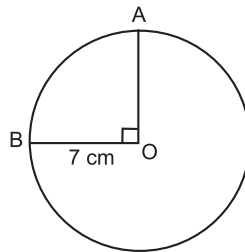
Select and write one most appropriate option out of the four options given for each of the questions 1 – 10.

1. If $x = -2$ is the root of the quadratic equation $x^2 - 3x - a = 0$ then the value of 'a' is
 - (a) -10
 - (b) 3
 - (c) 10
 - (d) -3
2. In the standard form of quadratic function $f(x) = ax^2 + bx + c$,
 - (a) a , b and c all are integers
 - (b) a , b and c all are real numbers
 - (c) a , b and c all are rational numbers
 - (d) a is a non-zero real number and b and c are real numbers.

3. The graph of the quadratic equation $x^2 - 4x - 5 = 0$
- upward parabola with turning point (2, 9)
 - upward parabola with turning point (2, -9)
 - downward parabola with turning point (-2, 9)
 - downward parabola with turning point (-2, -9)
4. In the figure, the measure of the angle $\angle BDC$ is



- 50°
 - 60°
 - 55°
 - 65°
5. A quadrant of a circle of radius 7 cm is shown in the figure. The perimeter of the quadrant OAB is



- 15 cm
 - 20 cm
 - 25 cm
 - 30 cm
6. The area of a rectangular park is 2730 cm^2 and its width is 21 m. The length of the park is
- 13 cm
 - 1.3 cm
 - 30 cm
 - 1.3 m
7. The value of the expression $\left[\frac{\cos 60^\circ + \sin 60^\circ}{\cos 60^\circ - \sin 60^\circ} \right]$ is
- $-(\sqrt{3} + 2)$
 - 1
 - $(\sqrt{3} - 2)$
 - $(\sqrt{3} + 2)$

8. A kite is flying at a height of 30 m from the ground. The length of string from the kite to the ground is 60 m. Assuming that there is no slack in the string, the angle of elevation of the kite at the ground is
- (a) 45° (b) 30°
(c) 60° (d) 90°
9. If the probability of winning a game is 0.3, then the probability of losing the game is
- (a) 0.3 (b) 0.6
(c) 0.7 (d) 0.9
10. In a throw of a pair of dice, the probability of getting a doublet is
- (a) $\frac{1}{3}$ (b) $\frac{1}{4}$
(c) $\frac{1}{5}$ (d) $\frac{1}{6}$

Section B

Fill in the blanks with the correct answer for each of the questions 11 – 20.

11. The zeroes of the quadratic functions $f(x) = x^2 - 3x - 4$ are _____ .
12. Every quadratic equation has _____ two roots.
13. The roots of the quadratic equation $2x^2 - 6x + 3 = 0$ are _____ .
14. Equal chords of a circle are _____ from the centre.
15. The opposite angles of a cyclic quadrilateral are _____ .
16. If a regular polygon of n sides of equal length, say a . then its perimeter is equal to _____ .
17. The value $\sin 30^\circ$ is _____ .
18. The angle of _____ of a point P is the angle between the line sight and the horizontal when the point P is above the horizontal.
19. The probability (p) of occurrence of an event E lies between _____ .
20. Probability of even prime number when a die is thrown once is _____ .

Section C

State whether the following statements are true or false for each of the questions 21 – 30.

21. The roots of the quadratic equation $ax^2 + bx + c = 0$ are the values of x where the graph intersects y -axis.
22. The roots of the quadratic equation $x^2 - 8x + 15 = 0$ are 3 and 5.
23. The quadratic function $f(x) = ax^2 + bx + c$ represents a parabola. The x -coordinate of vertex of parabola is given by: $-\frac{b}{2a}$.
24. Square is a special quadrilateral in which all four sides are equal.
25. Every circle has an infinite number of chords.
26. An angle in a semicircle is an obtuse angle.
27. The value of $\sin 150^\circ$ is 0.5.
28. In the 3rd quadrant (180° to 270°), only tangent gives positive values.
29. The probability of getting a number less than 7 when a die is tossed, is $\frac{1}{2}$.
30. The record of a weather station shows that out of the past 250 consecutive days, its weather forecasts were correct 175 times. Then, the probability that on a given day the forecast was correct is 0.7.

Section D

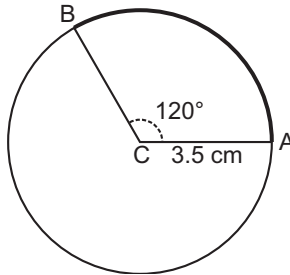
Answer each of the questions 31 – 40.

31. Find the truth set of the quadratic equation:

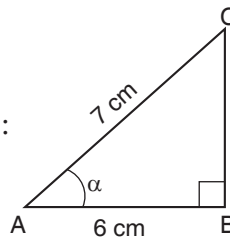
$$2x^2 + 10 = 9x$$
32. Find the roots of the quadratic equation by factorization:

$$6x^2 + 5x - 6 = 0$$
33. The breadth of a rectangular board is found to be 20 cm. Its area is found to be 220 cm^2 . Find its length.
34. The perimeter of an equilateral triangle is 60 cm. Find its area.

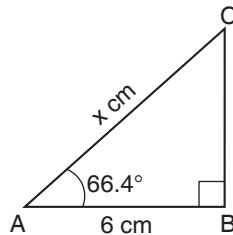
35. Find the perimeter of the sector ACB in the figure.



36. Find the angle α in the figure:



37. Find the side marked with letter x in the figure:



38. Evaluate: $\frac{\cos 30^\circ + \sin 60^\circ}{1 + \cos 60^\circ + \sin 30^\circ}$

39. One card is drawn at random from a well-shuffled pack of 52 cards. What is the probability that the card drawn is either a red or a king card?

40. Cards, each marked with one of the numbers 2, 4, 5, 6,....., 20, are placed in a box and mixed thoroughly. One card is drawn at random from the box. What is the probability of getting an even prime number?

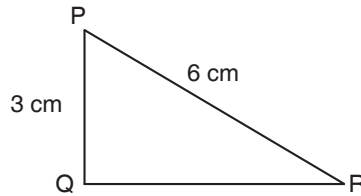
Section E

Answer each of the questions 41 – 45.

41. Find the two numbers whose sum is 27, and product is 182.

42. Find the area of a triangle whose length of each side is 3 cm, 5 cm and 4 cm.

43. In $\triangle PQR$, right-angled at Q (as shown in figure), $PQ = 3$ cm and $PR = 6$ cm. Determine $\angle QPR$ and $\angle PRQ$



44. An observer 1.5 m tall is 18.5 m away from the tower. The angle of elevations of the top of the tower from his eyes is 45° . What is the height of the tower?
45. In a survey of 150 families with four children to find the number of girls, the following results were obtained.

Number of girls	0	1	2	3	4
Frequency	8	41	55	33	13

Estimate the probability that a family with four children will have

- (i) two girls
(ii) no girls
(iii) one boy
(iv) four boys
(v) at least three girls