

## General Instructions:

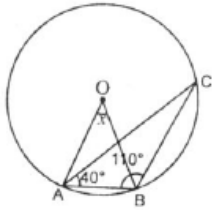
1. This question paper contains 38 questions.
2. This question paper is divided into 5 sections A, B, C, D and E.
3. In Section A, Questions 1 – 18 are multiple choice questions (MCQs) and question number 19 and 20 are Assertion – Reason based questions of 1 mark each.
4. In Section B, Questions 21 – 25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions 26 – 31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions 32 – 35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Question number 36 – 38 are case study based questions, carrying 4 marks each with sub parts of the values 1, 1 and 2 marks each respectively.
8. All questions are compulsory. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take  $\pi = \frac{22}{7}$ , wherever required if not stated.
11. Use of calculators is not allowed.

## Section – A

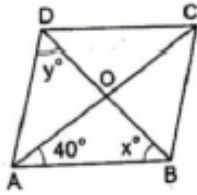
**Section A consists of 20 questions of 1 mark each.**

1. The point  $(0, -4)$  lies:
  - a. on the negative direction of  $y - axis$
  - b. in quadrant II
  - c. in quadrant IV
  - d. on the negative direction of  $x - axis$
2. Each side of an equilateral triangle is  $2x$  cm. If  $x\sqrt{3} = \sqrt{48}$ , then the area of the triangle is:

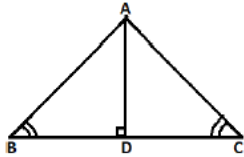
- a.  $\sqrt{48} \text{ cm}^2$    b.  $48\sqrt{3} \text{ cm}^2$    c.  $16\sqrt{3} \text{ cm}^2$    d.  $16 \text{ cm}^2$
3. In the given figure, O is the centre of the circle. If  $\angle CAB = 40^\circ$  and  $\angle CBA = 110^\circ$ , the value of  $x$  is:



- a.  $55^\circ$    b.  $80^\circ$    c.  $50^\circ$    d.  $60^\circ$
4. In the given figure, ABCD is a rhombus. Find the value of  $x$  and  $y$ .



- a.  $x = 55^\circ, y = 65^\circ$   
 b.  $x = 80^\circ, y = 80^\circ$   
 c.  $x = 75^\circ, y = 55^\circ$   
 d.  $x = 50^\circ, y = 50^\circ$
5. If  $4^x - 4^{x-1} = 24$ , then  $(2x)^x$  equals:
- a.  $\sqrt{5}$    b.  $25\sqrt{5}$    c. 125   d.  $5\sqrt{5}$
6. In the adjoining figure,  $\angle B = \angle C$  and  $AD \perp BC$ . The congruence criteria by which  $\triangle ABD \cong \triangle ADC$  is:

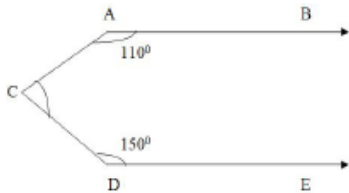


- a. SSS   b. SAS   c. RHS   d. AAS
7. The number of line(s) passing through one point is/are:
- a. one   b. three   c. two   d. not defined
8. The degree of the zero polynomial is:
- a. 0   b. any natural number   c. 1   d. not defined
9. The simplest rationalization of  $(2\sqrt{2} - \sqrt{3})$  is:
- a.  $\sqrt{2} + \sqrt{3}$    b.  $2\sqrt{2} + \sqrt{3}$    c.  $2\sqrt{2} + 3$    d.  $\sqrt{2} - \sqrt{3}$
10. The diagonals AC and BD of a parallelogram ABCD intersect each other at point O. If  $\angle DAC = 32^\circ$  and  $\angle AOB = 70^\circ$ , then  $\angle DBC$  is equal to:
- a.  $86^\circ$    b.  $38^\circ$    c.  $32^\circ$    d.  $24^\circ$
11. If  $x^{-2} = 64$ , then  $x^{\frac{1}{3}} + x^0 =$
- a.  $\frac{2}{3}$    b. 3   c.  $\frac{3}{2}$    d. 2

12. The linear equation  $2x - 5y = 7$  has:

- a. no solution
- b. infinitely many solutions
- c. a unique solution
- d. two solutions

13. In the adjoining figure, if  $AB \parallel DE$ , then the measure of  $\angle ACD$  is:

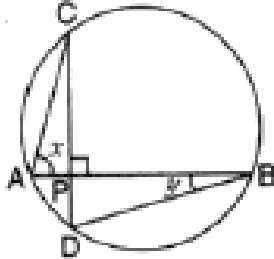


- a.  $90^\circ$
- b.  $100^\circ$
- c.  $80^\circ$
- d.  $70^\circ$

14. The value of  $(32)^{\frac{1}{5}} + (-7)^0 + (64)^{\frac{1}{2}}$  is:

- a. 10
- b. 0
- c. 11
- d. 1

15. In the given figure, if chords AB and CD of the circle intersect each other at right angles, then  $x + y =$



- a.  $75^\circ$
- b.  $45^\circ$
- c.  $90^\circ$
- d.  $60^\circ$

16. Abscissa of all the points on the  $x$ -axis is:

- a. -1
- b. 0
- c. 1
- d. any number

17. Express  $y$  in terms of  $x$  in the equation  $5x - 2y = 7$ .

- a.  $y = \frac{(5x-7)}{2}$
- b.  $y = \frac{7-5x}{2}$
- c.  $y = \frac{7x+5}{2}$
- d.  $y = \frac{5x+7}{2}$

18. If  $p(x) = 5x - 4x^2 + 3$ , then  $p(-1) =$

- a. -2
- b. -6
- c. 2
- d. 6

**Directions:** In question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R).

Choose the correct option.

- 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.

19. Assertion (A): ABCD is a square. AC and BD intersect at O. The measure of  $\angle AOB = 90^\circ$ .

Reason (R): Diagonals of a square bisect each other at right angles.

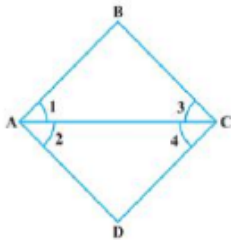
20. Assertion (A):  $\sqrt{3}$  is an irrational number.

Reason (R): Square root of a positive integer which is not a perfect square is an irrational number.

### Section – B

**Section B consists of 5 questions of 2 marks each.**

21. In the given figure, we have  $\angle 1 = \angle 3$  and  $\angle 2 = \angle 4$ . Show that  $\angle A = \angle C$ .



22. Read the following statements which are taken as axioms:

- (i) If two lines intersect each other, then the vertically opposite angles are not equal.
- (ii) If a ray stands on a line, then the sum of the two adjacent angles so formed is equal to  $180^\circ$ .

Is this system of axioms consistent? Justify your answer.

23. Which of the following points lie on the  $y$  – axis?

$A(1, 1), B(3, 0), C(0, 3), D(0, 0), E(-5, 0), G(9, 0), H(0, -8)$ .

24. Simplify:  $(\sqrt{3} - \sqrt{2})^2$

**OR**

Find the value of  $a$  if  $\frac{6}{3\sqrt{2}-2\sqrt{3}} = 3\sqrt{2} - a\sqrt{3}$ .

25. The height of a conical vessel is 3.5 cm. If its capacity is 3.3 litres of milk. Find the diameter of its base.

**OR**

The radius and slant height of a cone are in the ratio 4 : 7. If its curved surface area is  $792 \text{ cm}^2$ , find its radius. (Use  $\pi = \frac{22}{7}$ )

### Section – C

**Section C consists of 6 questions of 3 marks each.**

26. Simplify:  $\frac{\sqrt{25}}{\sqrt[3]{64}} + \left(\frac{256}{625}\right)^{-\frac{1}{4}} + \frac{1}{\left(\frac{64}{125}\right)^{\frac{2}{3}}}$

27. Various mode of transport used by 1850 students of a school are given below:

Mode of transport	School bus	Private bus	Bicycle	Rickshaw	By foot
No. of students	640	360	490	210	150

Draw a bar graph to represent the above data.

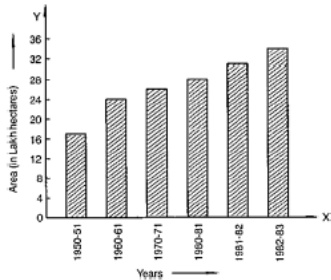
28. ABC is a triangle right angled at C. A line through the midpoint M of hypotenuse AB and parallel to BC intersects AC at D. Prove that:

- D is the midpoint of AC.
- MD is perpendicular to AC.
- $CM = AM = \frac{1}{2} AB$

29. Find a solution of the linear equation  $x + 2y = 8$  which represents a point on:

- the  $x - axis$
- the  $y - axis$

30. Read the bar graph given in the given figure and answer the following questions:



- What information is given by the bar graph?
- In which years the areas under the sugarcane crop were maximum and the minimum?
- State whether true or false:  
The area under the sugarcane crop in the year 1982 – 83 is three times that of the year 1950 – 51.

**OR**

Construct a histogram for the following data:

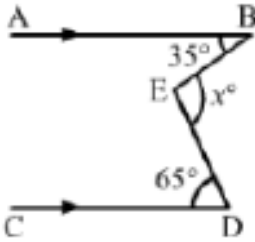
Monthly school fee (in ₹)	30 – 60	60 – 90	90 – 120	120 – 150	150 – 180	180 – 210	210 – 240
No. of schools	5	12	14	18	10	9	4

31. If  $x + 2a$  is a factor of  $x^5 - 4a^2x^3 + 2x + 2a + 3$ , find the value of  $a$ .

**Section – D**

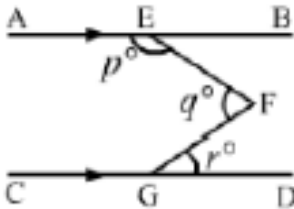
**Section D consists of 4 questions of 5 marks each.**

32. In each of the figures given below,  $AB \parallel CD$ . Find the value of  $x$ .



**OR**

In the given figure,  $AB \parallel CD$ . Prove that  $p + q - r = 180^\circ$ .



33. A cloth having an area of  $165 \text{ m}^2$  is shaped into the form of a conical tent of radius 5 m.

- (i) How many students can sit in the tent if a student on an average occupies  $\frac{5}{7} \text{ m}^2$  on the ground?
- (ii) Find the volume of the cone.

34. The perimeter of a triangular field is 420 m and its sides are in the ratio 6 : 7 : 8. Find the area of the triangular field.

**OR**

The sides of a triangle are in the ratio 5 : 12 : 13 and its perimeter is 150 m. Find the area of the triangle.

35. Using factor theorem, factorise the polynomial  $2x^4 - 7x^3 - 13x^2 + 63x - 45$ .

**Section – E**

**Section E consists of 3 case study based questions of 4 marks each.**

36. Peter, Kevin James, Reeta and Veena were students of class 9<sup>th</sup> B at Govt. Sr. Sec. School, Sector 5, Gurgaon. Once the teacher told Peter to think of a number  $x$  and to Kevin to think of another number  $y$  so that the difference of the numbers is 10 ( $x > y$ ).

Now the teacher asked James to add double of Peter's number and that three times of Kevin's number, the total was found to be 120.

Reeta just entered in the class, she did not know any number. The teacher said Reeta to form the first equation with two variables  $x$  and  $y$ . Now Veena just entered the class to the teacher told her to form second equation with two variables  $x$  and  $y$ . Now the teacher told Reeta to find the values of  $x$  and  $y$ . Peter and Kelvin were told to verify the numbers  $x$  and  $y$ .

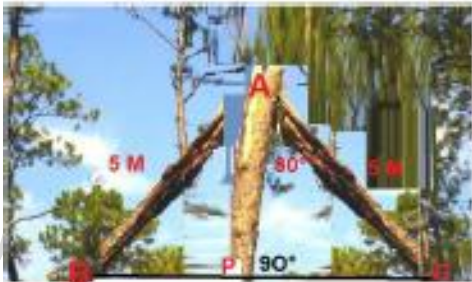


- (i) What are the equations formed by Reeta and Veena?
- (ii) What was the equation formed by Veena?
- (iii) Which number did Peter think?

**OR**

Which number did Kevin think?

37. In a forest, a big tree broke due to heavy rain and wind. Due to this rain the big branches AB and AC with length 5 m fell on the ground. Branch AC makes an angle of  $30^\circ$  with the main tree AP. The distance of point B from P is 4 m. You can observe that  $\Delta ABP$  is congruent to  $\Delta ACP$ .



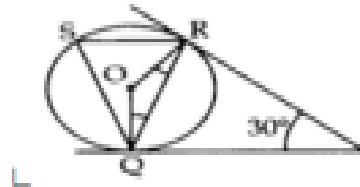
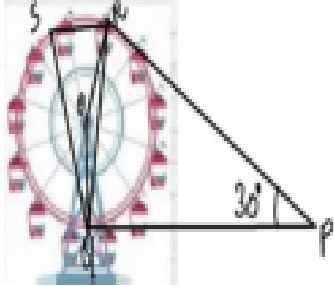
- (i) Show that  $\Delta ACP$  and  $\Delta ABP$  are congruent.
- (ii) Find the value of  $\angle ACP$ .
- (iii) Find the value of  $\angle BAP$ .

**OR**

What is the total height of the tree?

38. A Ferris wheel (or a big wheel in the United Kingdom) is an amusement ride consisting of a rotating upright wheel with multiple passenger carrying components (commonly referred to as passenger cars, cabins, tubs, capsules, gondolas, or pods) attached to the rim in such a way that as the wheel turns, they are kept upright, usually by gravity.

After taking a ride in Ferris wheel, Aarti came out from the crowd and was observing her friends who were enjoying the ride. She was curious about the different angles and the measures that the wheel will form. She forms the figure as given below.



- (i) Find the value of  $\angle ROQ$ .
- (ii) Find the value of  $\angle RQP$ .
- (iii) Find the value of  $\angle RSQ$ .

**OR**

Find the value of  $\angle ORP$ .