

CCE MODEL TEST PAPER

SECOND TERM (SA-II)

MATHEMATICS

(With Answers)

CLASS X

Time Allowed : 3 Hours]

[Maximum Marks : 80

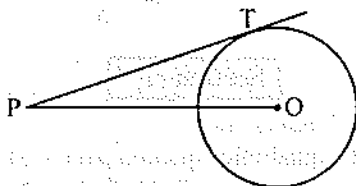
General Instructions :

- All questions are compulsory.
- The question paper consists of 34 questions divided into four sections A, B, C and D. Section A comprises of 10 questions of 1 mark each, Section B comprises of 8 questions of 2 marks each, Section C comprises of 10 questions of 3 marks each and Section D comprises of 6 questions of 4 marks each.
- Question numbers 1 to 10 in Section A are multiple choice questions where you are to select one correct option out of the given four.
- There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four marks each. You have to attempt only one of the alternatives in all such questions.
- Use of calculators is not permitted.

Section 'A'

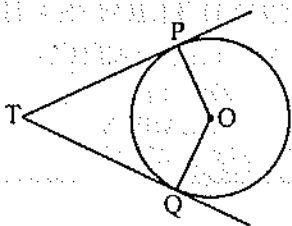
Question numbers 1 to 10 are of one mark each.

- The roots of the quadratic equation $x^2 + 5x - (\alpha + 1)(\alpha + 6) = 0$, where α is a constant, are
(a) $\alpha + 1, \alpha + 6$ (b) $(\alpha + 1), -(\alpha + 6)$
(c) $-(\alpha + 1), (\alpha + 6)$ (d) $-(\alpha + 1), -(\alpha + 6)$
- The value of $a_{30} - a_{20}$ for the A.P. 2, 7, 12, 17, ... is
(a) 100 (b) 10
(c) 50 (d) 20
- In figure, point P is 26 cm away from the centre O of a circle and the length PT of the tangent drawn from P to the circle is 24 cm. Then the radius of the circle is



- 25 cm (b) 26 cm
(c) 24 cm (d) 10 cm
- If the area of a circle is numerically equal to twice its circumference, then the diameter of the circle is
(a) 4 units (b) π units
(c) 8 units (d) 2 units

5. In figure, TP and TQ are two tangents to a circle with centre O such that $\angle POQ = 110^\circ$. Then $\angle PTQ$ is equal to



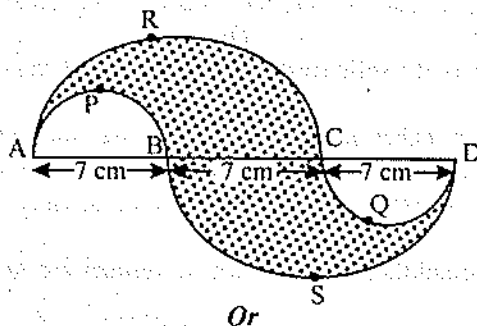
- (a) 55° (b) 70°
 (c) 110° (d) 90°
6. A solid is hemispherical at the bottom and conical (of same radius) above it. If the surface areas of the two parts are equal, then the ratio of its radius and the slant height of the conical part is
- (a) 2 : 1 (b) 1 : 2
 (c) 1 : 4 (d) 4 : 1
7. At some time of the day, the length of the shadow of a tower is equal to its height. Then the sun's altitude at that time is
- (a) 30° (b) 60°
 (c) 90° (d) 45°
8. The line segment joining the points $A(-2, -3)$ and $B(2, -1)$ is divided by the y -axis in the ratio
- (a) 1 : 2 (b) 2 : 1 (c) 1 : 1 (d) 1 : 3
9. The area (in square units) of the triangle formed by the points $A(a, 0)$, $O(0, 0)$ and $B(0, b)$ is
- (a) ab (b) $\frac{1}{2}ab$
 (c) $\frac{1}{2}a^2b^2$ (d) $\frac{1}{2}b^2$
10. The probability of throwing a number greater than 2 with a fair die is
- (a) $\frac{2}{3}$ (b) $\frac{5}{6}$
 (c) $\frac{1}{3}$ (d) $\frac{2}{5}$

Section 'B'

Question numbers 11 to 18 carry 2 marks each.

11. Find the value of p so that the quadratic equation $px(x - 3) + 9 = 0$ has two equal roots.
 12. Find whether -150 is a term of the A.P. $17, 12, 7, 2, \dots$?
 13. Two concentric circles are of radii 7 cm and r cm respectively, where $r > 7$. A chord of the larger circle, of length 48 cm, touches the smaller circle. Find the value of r .
 14. Draw a line segment of length 6 cm. Using compasses and ruler, find a point P on it which divides it in the ratio $3 : 4$.

15. In figure, APB and CQD are semi-circles of diameter 7 cm each, while ARC and BSD are semi-circles of diameter 14 cm each. Find the perimeter of the shaded region. [Use $\pi = \frac{22}{7}$]



Find the area of a quadrant of a circle, where the circumference of circle is 44 cm.

- *16. Two cubes, each of side 4 cm are joined end to end. Find the surface area of the resulting cuboid.
17. Find that value(s) of x for which the distance between the points $P(x, 4)$ and $Q(9, 10)$ is 10 units.
18. A coin is tossed two times. Find the probability of getting at least one head.

Section 'C'

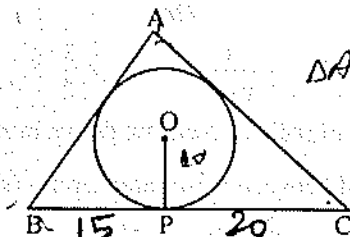
Question numbers 19 to 28 carry 3 marks each.

- *19. Find the roots of the following quadratic equation :

$$\sqrt{3}x^2 - 2\sqrt{2}x - 2\sqrt{3} = 0$$

- *20. Find the sum of first n terms of an A.P. whose n th term is $5n - 1$. Hence find the sum of first 20 terms.

- *21. In figure, a triangle ABC is drawn to circumscribe a circle of radius 10 cm such that the segments BP and PC into which BC is divided by the point of contact P , are of lengths 15 cm and 20 cm respectively. If the area of $\triangle ABC = 525 \text{ cm}^2$, then find the lengths of sides AB and AC .



22. Draw a line segment AB of length 7 cm. Taking A as centre, draw a circle of radius 3 cm and taking B as centre, draw another circle of radius 2 cm. Construct tangents to each circle from the centre of the other circle.

Or

- Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then construct another triangle whose sides are $\frac{3}{4}$ times the corresponding sides of the isosceles triangle.

23. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding minor segment and hence find the area of the major segment. [Use $\pi = 3.14$]

24. From a solid cylinder of height 14 cm and base diameter 7 cm, two equal conical holes each of radius 2.1 cm and height 4 cm are cut off. Find the volume of the remaining solid.

Or

The radii of the circular ends of a solid frustum of a cone are 18 cm and 12 cm and its height is 8 cm. Find its total surface area. [Use $\pi = 3.14$]

25. A ladder of length 6 m makes an angle of 45° with the floor while leaning against one wall of a room. If the foot of the ladder is kept fixed on the floor and it is made to lean against the opposite wall of the room, it makes an angle of 60° with the floor. Find the distance between these two walls of the room.

26. Find the area of the quadrilateral $ABCD$ whose vertices are $A(3, -1)$, $B(9, -5)$, $C(14, 0)$ and $D(9, 19)$.

27. Find the coordinates of the points which divide the line segment joining $A(2, -3)$ and $B(-4, -6)$ into three equal parts.

Or

Show that the points $A(3, 5)$, $B(6, 0)$, $C(1, -3)$ and $D(-2, 2)$ are the vertices of a square $ABCD$.

28. Cards marked with numbers 5, 6, 7, ..., 74 are placed in a bag and mixed thoroughly. One card is drawn at random from the bag. Find the probability that the number on the card is a perfect square.

Section 'D'

Question numbers 29 to 34 carry 4 marks each.

29. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

30. The first and the last terms of an A.P. are 8 and 350 respectively. If its common difference is 9, how many terms are there and what is their sum?

Or

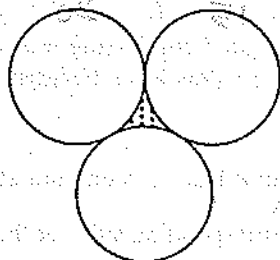
How many multiples of 4 lie between 10 and 250? Also find their sum.

31. A train travels 180 km at a uniform speed. If the speed had been 9 km/hour more, it would have taken 1 hour less for the same journey. Find the speed of the train.

Or

Find the roots of the equation $\frac{1}{2x-3} + \frac{1}{x-5} = 1$, $x \neq \frac{3}{2}, 5$.

32. In figure, three circles each of radius 3.5 cm are drawn in such a way that each of them touches the other two. Find the area enclosed between these three circles (shaded region). [Use $\pi = \frac{22}{7}$]



33. Water is flowing at the rate of 15 km/hour through a pipe of diameter 14 cm into a cuboidal pond which is 50 m long and 44 m wide. In what time will the level of water in the pond rise by 21 cm ?

34. The angle of elevation of the top of a vertical tower from a point on the ground is 60° . From another point 10 m vertically above the first, its angle of elevation is 30° . Find the height of the tower.

ANSWERS

Section 'A'

- | | | |
|---------|--------|--------|
| 1. (b) | 2. (c) | 3. (d) |
| 4. (c) | 5. (b) | 6. (b) |
| 7. (d) | 8. (c) | 9. (b) |
| 10. (a) | | |

Section 'B'

- | | | |
|----------------------------------|---|-------------------------|
| 11. $p = 4$ | 12. - 150 is not a term of the given A.P. | |
| 13. $r = 25$ cm | | |
| 15. 66 cm Or 38.5 cm^2 | 16. 160 cm^2 | 17. $x = 17$ or $x = 1$ |
| 18. $\frac{3}{4}$ | | |

Section 'C'

- | | | |
|---|---|-------------------------|
| 19. $x = \sqrt{6}$ and $x = -\frac{1}{3}\sqrt{6}$ | 20. $\frac{n}{2}(5n + 3)$ and 1030 | 21. 32.5 cm and 37.5 cm |
| 23. 28.5 cm^2 ; 285.5 cm^2 | 24. 502.04 cm^3 Or 2411.52 cm^2 | |
| 25. 7.242 m | 26. 182 sq. units | |
| 27. (0, -4), (-2, -5) | 28. $\frac{3}{35}$ | |

Section 'D'

- | | | |
|--|-------------|----------|
| 30. $t_n = 39$ and $S_n = 6981$ Or $S_{60} = 7800$ | | |
| 31. 36 km/hour Or $x = 4 \pm \frac{3\sqrt{2}}{2}$ | | |
| 32. 1.94 cm^2 | 33. 2 hours | 34. 15 m |