

CCE MODEL TEST PAPER

SECOND TERM (SA-II)

MATHEMATICS

(With Answers)

CLASS X

Time Allowed : 3 Hours

Maximum Marks : 80

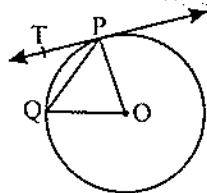
General Instructions :

- 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'

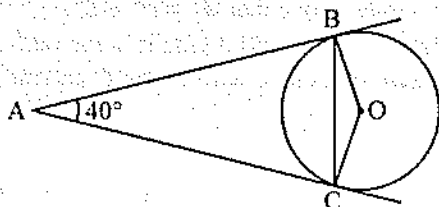
Question numbers 1 to 10 are of one mark each.

- The roots of the equation $x^2 - 3x - m(m+3) = 0$, where m is a constant, are
 - $m, m+3$
 - $-m, m+3$
 - $m, -(m+3)$
 - $-m, -(m+3)$
- If the common difference of an A.P. is 3, then $a_{20} - a_{15}$ is
 - 5
 - 3
 - 15
 - 20
- In figure, O is the centre of a circle, PQ is a chord and PT is the tangent at P . If $\angle POQ = 70^\circ$, then $\angle TPQ$ is equal to



- 55°
 - 70°
 - 45°
 - 35°
- The perimeter (in cm) of a square circumscribing a circle of radius a cm, is
 - $8a$
 - $4a$
 - $2a$
 - $16a$

5. In figure, AB and AC are tangents to the circle with centre O such that $\angle BAC = 40^\circ$. Then $\angle OBC$ is equal to



(a) 10°

(c) 30°

(b) 20°

(d) 25°

6. The radius (in cm) of the largest right circular cone that can be cut out from a cube of edge 4.2 cm is

(a) 4.2

(c) 8.4

(b) 2.1

(d) 1.05

7. A tower stands vertically on the ground. From a point on the ground which is 25 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 45° . Then the height (in metres) of the tower is

(a) $25\sqrt{2}$

(c) 25

(b) $25\sqrt{3}$

(d) 12.5

8. If $P\left(\frac{a}{2}, 4\right)$ is the mid-point of the line-segment joining the points $A(-6, 5)$ and $B(-2, 3)$, then the value of a is

(a) -8

(c) -4

(b) 3

(d) 4

9. If A and B are the points $(-6, 7)$ and $(-1, -5)$ respectively, then the distance $2AB$ is equal to

(a) 13

(c) 169

(b) 26

(d) 238

10. A card is drawn from a well-shuffled deck of 52 playing cards. The probability that the card will not be an ace is

(a) $\frac{1}{13}$

(c) $\frac{12}{13}$

(b) $\frac{1}{4}$

(d) $\frac{3}{4}$

Section 'B'

Question numbers 11 to 18 carry 2 marks each.

11. For what value of k does the quadratic equation

$$(k-5)x^2 + 2(k-5)x + 2 = 0 \text{ have equal roots?}$$

12. How many two-digit numbers are divisible by 7?

Or

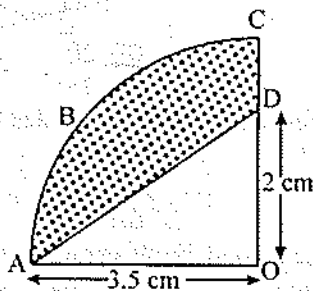
If $\frac{1}{x+2}$, $\frac{1}{x+3}$ and $\frac{1}{x+5}$ are in A.P., find the value of x .

*13. If $d_1, d_2 (d_2 > d_1)$ be the diameters of two concentric circles and c be the length of a chord of a circle which is tangent to the other circle, prove that $d_2^2 = c^2 + d_1^2$.

14. Draw a line segment of length 7.6 cm and divide it in the ratio 3 : 2.

15. In figure, $OABC$ is a quadrant of a circle with centre O and radius 3.5 cm. If $OD = 2$ cm, find the area of the shaded region.

$$\left[\text{Use } \pi = \frac{22}{7} \right]$$



16. The dimensions of a metallic cuboid are 100 cm \times 80 cm \times 64 cm. It is melted and recast into a cube. Find the surface area of the cube.

*17. Find a relation between x and y such that the point $P(x, y)$ is equidistant from the points $A(1, 4)$ and $B(-1, 2)$.

*18. Two different dice are thrown at the same time. Find the probability that the sum of the two numbers appearing on the top of the dice is 7.

Section 'C'

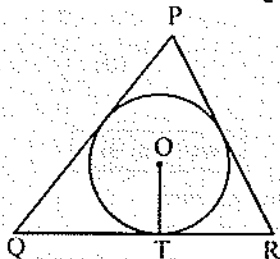
Question numbers 19 to 28 carry 3 marks each.

19. Find the roots of the following quadratic equation :

$$x^2 - 3\sqrt{5}x + 10 = 0$$

*20. Find an A.P. whose fourth term is 9 and the sum of its sixth term and thirteenth term is 40.

21. In figure, a triangle PQR is drawn to circumscribe a circle of radius 6 cm such that the segments QT and TR into which QR is divided by the point of contact T , are of lengths 12 cm and 9 cm respectively. If the area of $\Delta PQR = 189 \text{ cm}^2$, then find the lengths of sides PQ and PR .



22. Draw a pair of tangents to a circle of radius 3 cm, which are inclined to each other at an angle of 60° .

Or

Draw a right triangle in which the sides (other than hypotenuse) are of lengths 4 cm and 3 cm. Then construct another triangle whose sides are $\frac{3}{5}$ times the corresponding sides of the given triangle.

23. A chord of a circle of radius 14 cm subtends an angle of 120° at the centre. Find the area of the corresponding minor segment of the circle. [Use $\sqrt{3} = 1.73$]

24. An open metal bucket is in the shape of a frustum of a cone of height 21 cm with radii of its lower and upper ends as 10 cm and 20 cm respectively. Find the cost of milk which can completely fill the bucket at ₹ 30 per litre. [Use $\pi = \frac{22}{7}$]

25. Point $P(x, 4)$ lies on the line segment joining the points $A(-5, 8)$ and $B(4, -10)$. Find the ratio in which point P divides the line segment AB . Also find the value of x .

26. Find the area of quadrilateral $ABCD$, whose vertices are $A(-3, -1)$, $B(-2, -4)$, $C(4, -1)$ and $D(3, 4)$.

Or

Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are $A(2, 1)$, $B(4, 3)$ and $C(2, 5)$.

27. From the top of a vertical tower, the angles of depression of two cars, in the same straight line with the base of the tower, at an instant are found to be 45° and 60° . If the cars are 100 m apart and are on the same side of the tower, find the height of the tower. [Use $\sqrt{3} = 1.73$]

28. Two dice are rolled once. Find the probability of getting such numbers on the two dice, whose product is 12.

Or

A box contains 80 discs which are numbered from 1 to 80. If one disc is drawn at random from the box, find the probability that it bears a perfect square number.

Section 'D'

Question numbers 29 to 34 carry 4 marks each.

29. A motor boat whose speed is 20 km/h in still water, takes 1 hour more to go 48 km upstream than to return downstream to the same spot. Find the speed of the stream.

Or

Find the roots of the equation $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$, $x \neq -4, 7$.

30. If the sum of first 4 terms of an A.P. is 40 and that of first 14 terms is 280, find the sum of its first n terms.

Or

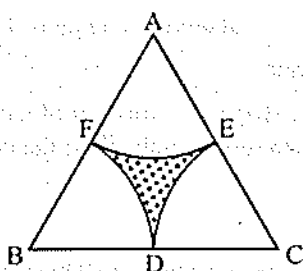
Find the sum of the first 30 positive integers divisible by 6.

31. Prove that the lengths of tangents drawn from an external point to a circle are equal.

32. From a solid cylinder whose height is 15 cm and diameter 16 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid. [Take $\pi = 3.14$]

33. In figure, arcs are drawn by taking vertices A , B and C of equilateral triangle ABC of side 14 cm as centres to intersect the sides BC , CA and AB at their respective mid-point D , E and F . Find the area of the shaded region.

[Use $\pi = \frac{22}{7}$ and $\sqrt{3} = 1.73$]



34. Two poles of equal heights are standing opposite to each other on either side of the road, which is 100 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60° and 30° , respectively. Find the height of the poles.

ANSWERS

Section 'A'

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

Section 'B'

- | | | |
|--------------------------|--------------------------|---------------------|
| 11. $k = 7$ | 12. $x = 13$ Or $x = 1$ | |
| 15. 6.125 cm^2 | 16. 38400 cm^2 | 17. $x + y - 3 = 0$ |
| 18. $\frac{1}{6}$ | | |

Section 'C'

- | | | |
|---|---------------------|---------------------|
| 19. $x = 2\sqrt{5}$ and $x = -\sqrt{5}$ | 20. 3, 5, 7, 9, ... | |
| 21. 22.5 cm and 19.5 cm | | |
| 23. 120.56 cm^2 | 24. ₹ 462 | 25. 2 : 7, $x = -3$ |
| 26. 28 sq. units Or 1 sq. unit | | 27. 236.5 m |
| 28. $\frac{1}{9}$ Or $\frac{1}{10}$ | | |

Section 'D'

- | | |
|-----------------------------------|---------------------------|
| 29. 4 km/h Or $x = 1$ and $x = 2$ | |
| 30. $S_n = n^2 + 6n$ Or 2790 | 32. 1381.6 cm^2 |
| 33. 7.77 cm^2 | 34. 43.3 m |