

CCE MODEL TEST PAPER

SECOND TERM (SA-II)

MATHEMATICS

(With Answers)

CLASS X

Time Allowed : 3 Hours]

[Maximum Marks : 80

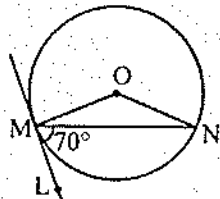
General Instructions :

- 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.

- If $-1, m, 7$ are three consecutive terms of an A.P., then the value of m is
 - 2
 - 3
 - 4
 - 5
- Cards marked with the numbers 2 to 51 are placed in a box and mixed thoroughly. One card is drawn from this box. The probability that the number on the card is an even number is
 - $\frac{1}{2}$
 - $\frac{2}{3}$
 - $\frac{1}{3}$
 - $\frac{3}{4}$
- In figure O is centre of a circle, MN is chord and the tangent ML at M makes an angle of 70° with MN then $\angle MON$ is equal to :



- 120°
- 90°
- 140°
- 70°

4. If the distance between the points $(3, m)$ and $(4, 1)$ is $\sqrt{10}$, then the value of m is

- (a) $4, -3$ (b) $2, -1$
(c) $4, -2$ (d) $2, -3$

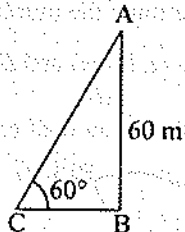
5. The value of m for which the given equation $12x^2 + 4mx + 3 = 0$ has equal roots is

- (a) ± 3 (b) ± 2
(c) ± 4 (d) ± 1

6. The 12th term of the sequence $5, 2, -1, -4, -7, \dots$ is

- (a) -24 (b) -28
(c) -25 (d) -26

7. A kite is flying at a height of 60 m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is 60° . The length of the string assuming that there is no slack in the string is

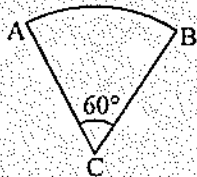


- (a) $20\sqrt{3}$ m (b) $60\sqrt{3}$ m
(c) $40\sqrt{3}$ m (d) $30\sqrt{3}$ m

8. The value of k for which the difference between the roots of the equation $x^2 + kx + 8 = 0$ is 2 are

- (a) ± 6 (b) ± 8
(c) ± 4 (d) ± 2

9. If the following figure is a sector of a circle of radius 21 cm, then the perimeter of a sector is



- (a) 64 cm (b) 63 cm
(c) 62 cm (d) 61 cm

10. A solid sphere of radius r is melted and cast into the shape of a solid cone of height r , then the radius of the base of cone is

- (a) $2r$ (b) r
(c) $4r$ (d) $3r$

Section 'B'

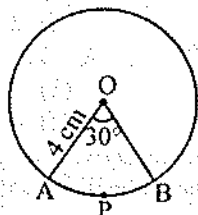
Question numbers 11 to 18 carry 2 marks each.

11. A black and a white die are thrown at the same time. Find the probability of obtaining

- (i) a total of 6.
(ii) the same number on both dice.

12. The cost of planting grass in a circular park at the rate of ₹ 4.90/m² is ₹ 24,640. A path of uniform width runs around the park. The cost of gravelling the path at the rate of ₹ 3.50/m² is ₹ 3696. Find the cost of fencing the path on both sides at the rate of ₹ 2.10/m.

13. Find the area of the sector of a circle with radius 4 cm and of angle 30°. Also, find the area of the corresponding major sector. [Use $\pi = 3.14$]

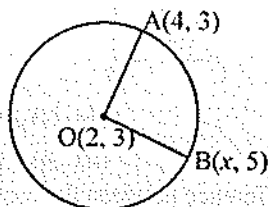


14. The sum of two numbers is 8. Determine the numbers if the sum of their reciprocals is $\frac{8}{15}$.

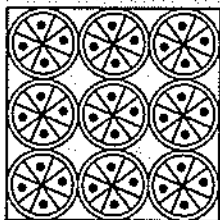
15. If the distance of $P(x, y)$ from $A(l + m, l - m)$ and $B(l - m, l + m)$ are equal, prove that $mx = ly$.

Or

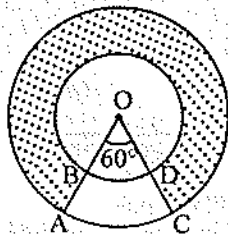
If the points $A(4, 3)$ and $B(x, 5)$ are on the circle with centre $O(2, 3)$, find the values of x .



16. On a square handkerchief, nine circular designs each of radius 7 cm are made. Find the area of the remaining portion of the handkerchief.



17. Find the area of the shaded region in figure, where radii of two concentric circles with centre O are 7 cm and 14 cm respectively and $\angle AOC = 60^\circ$.



18. Prove that in two concentric circles, the chord of the larger circle, which touches the smaller circle is bisected at the point of contact.

Section 'C'

Question numbers 19 to 28 carry 3 marks each.

19. Which term of the A.P. : 3, 15, 27, 39, will be 132 more than 54th term ?

Or

A sum of ₹ 700 is to be used to give seven cash prizes to students of a school for their overall academic performance. If each prize is ₹ 20 less than its preceding prize, find the value of each of the prizes.

20. Find the lengths of the medians of the triangle whose vertices are $(1, -1)$, $(0, 4)$ and $(-5, 3)$.

21. Construct a triangle with sides 5 cm, 6 cm and 7 cm and then another triangle whose sides are $\frac{7}{5}$ of the corresponding sides of the first triangle.

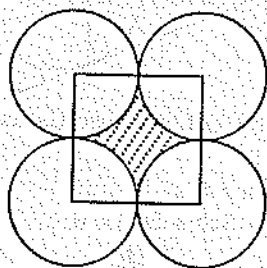
22. A person standing on the bank of a river, observes that the angle of elevation of the top of a tree, standing on the opposite bank is 60° . When he moves 60 m away from the bank, he finds the angle of elevation to be 30° . Find the height of the tree and the width of the river.

Or

An aeroplane when flying at a height of 4000 m from the ground passes vertically above another aeroplane at an instant when the angles of the elevation of the two planes from the same point on the ground are 60° and 45° respectively. Find the vertical distance between the aeroplanes at that instant.

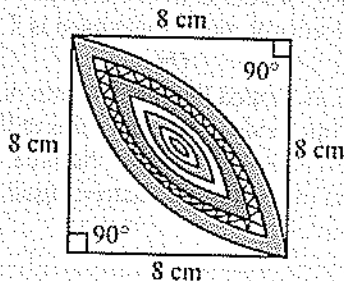
23. Four equal circles are described about the four corners of a square so that each touches two of the others as shown in figure. Find the area of the shaded region, each side of the square measuring 21 cm.

[Take $\pi = \frac{22}{7}$]



24. Prove that the angle between the two tangents to a circle drawn from an external point is supplementary to the angle subtended by the line segment joining the point of contact at the centre.

25. Calculate the area of the designed region in figure, common between the two quadrants of circles of radius 8 cm each.



26. Cards marked with the numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from the box. Find the probability that the number on the card is

(i) a number which is a perfect square.

- (ii) a prime number less than 20.
 (iii) a number which is multiple of '5'.

27. Divide 29 into two parts so that the sum of the squares of the parts is 425.

Or

Solve the following equation for x :

$$\frac{3x-4}{7} + \frac{7}{3x-4} = \frac{5}{2}, x \neq \frac{4}{3}$$

28. Prove that a parallelogram circumscribing a circle is a rhombus.

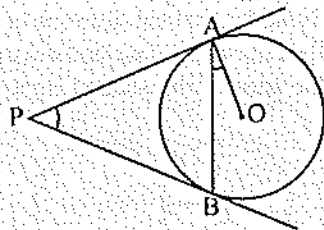
Section 'D'

Question numbers 29 to 34 carry 4 marks each.

29. Find the sum of all the three digit numbers which have the remainder 3 when divided by 5.

30. From the top and foot of a tower 40 m high, the angle of elevation of the top of a light-house is found to be 30° and 60° respectively. Find the height of the light-house. Also, find the distance of the top of the light-house from the foot of the tower.

31. Two tangents PA and PB are drawn to a circle with centre O from an external point P . Prove that $\angle APB = 2\angle OAB$.



32. Find the area of the quadrilateral $ABCD$ whose vertices are $A(-4, -2)$, $B(-3, -5)$, $C(3, -2)$ and $D(2, 3)$.

33. Solve the following equation for x :

$$9x^2 - 9(a+b)x + (2a^2 + 5ab + 2b^2) = 0$$

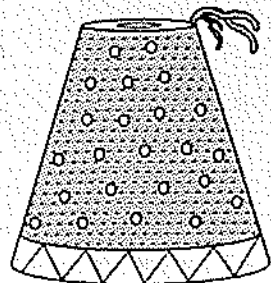
Or

A two digit number is such that the product of its digits is 15. If 18 is added to the number, the digits interchange their places. Find the number.

34. A bucket made up of a metal sheet is in the form of a frustum of a cone of height 16 cm with diameters of its lower and upper ends as 16 cm and 40 cm respectively. Find the volume of the bucket. Also find the cost of the bucket if the cost of metal sheet used is ₹ 20 per 100 cm^2 . [Use $\pi = 3.14$]

Or

A *fez*, the cap used by the Turks, is shaped like the frustum of a cone (see figure). If its radius on the open side is 10 cm, radius at the upper base is 4 cm and its slant height is 15 cm. find the area of material used for making it. Also, find the cost of the material used to make the cap, if its cost ₹ 7 per 10 cm^2 .



ANSWERS**Section 'A'**

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

Section 'B'

11. (i) $\frac{5}{36}$, (ii) $\frac{1}{6}$ 12. ₹ 1108.80
13. Area of sector = 4.186 cm², Area of major sector = 46.054 cm²
14. Numbers are 3 and 5 15. Or $x = 2$
16. Area of the remaining portion = 378 cm²
17. Area of the shaded region = 385 cm²

Section 'C'

19. 65th term Or 160, 140, 120, 100, 80, 60, 40
20. Length of the medians are $\frac{\sqrt{130}}{2}$, $\sqrt{13}$ and $\frac{\sqrt{130}}{2}$
22. Height of the tree = 51.96 m and the width of the river = 30 m
Or Vertical distance between the aeroplanes = 1693.3 m
23. Area of the shaded region = 94.5 cm²
25. Area of the designed region = $\frac{256}{7}$ cm²
26. (i) $\frac{9}{100}$, (ii) $\frac{2}{25}$, (iii) $\frac{1}{5}$ 27. Parts are 16 and 13 Or $6, \frac{5}{2}$

Section 'D'

29. Sum of all the three digit numbers = 99090
30. Distance of the top of the light-house from the foot of the tower = $40\sqrt{3}$ m and height of the light-house = 60 m
32. Area of the quadrilateral ABCD = 28 sq. units.
33. $x = \frac{2a+b}{3}$ or $x = \frac{a+2b}{3}$ Or 35
34. Volume of the frustum of a cone = 10449.92 cm³, and cost of metal used = ₹ 391.87
Or $710\frac{2}{7}$ cm², ₹ 497.20