KANNUR DISTRICT PANCHAYATH - DIET KANNUR

MUKULAM PROGRAMME

SSLC MODEL EXAMINATION -2021

MATHEMATICS

Maximum Score: 80 **Time: $2\frac{1}{2}$ hours**

Instructions

- 20 minutes is given as cool of time. Use this time to read the questions and plan your answers.
- Attempt the question according to the instructions.
- Keep in mind the score and the time while answering the question.
- The maximum score for questions from 1 to 45 will be 80.
- Simplify using the approximate value of $\pi, \sqrt{2}, \sqrt{3}$ only if it is asked to do in question.

Questions from 1 to 5 carry one score each.(Choose the correct answer from the bracket.)

1. Which of the coordinate given below cannot be a point on the x-axis?

   [(1,0),(0,1),(-1,0),(0,0)]

2. Select the number which is a term of the arithmetic sequence 3n+2

   [100,60,48,2]

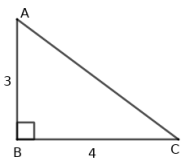
3. Which is the number x satisfying the equation $(x-4)^2$=36 ?

   [6,-6,-10,-2]

4. (11, y) is a point on the line joining A(3,1), B(5,4). What is y ?

   [7,10,11,13]

5. In right angled triangle ABC, AB=3 centimetres, BC=4 centimetres. What is sin A ?



$$\left[\frac{3}{4}, \frac{4}{5}, \frac{3}{5}, \frac{4}{3}\right]$$

Questions from 6 to 10 carry 2 score each

6. Weight of children(in Kilogram) in a nursery is given below. Find the Arithmetic mean and median of weights.

   15, 11, 14, 18, 12, 17, 12, 20, 18,13

7. $p(x) = x^2 - 8x + 5$

   (a) Find p(2)

   (b) What number is to be added to p(x) to get a polynomial for which x-2 is a factor ?

8. Find the algebraic expression of the arithmetic sequence 6,13,20, ... Find its 20^{th} term.

9. A person is asked to say a two digit number.
   What is the probability that it is a multiple of 11

10. (a) What number is to be added to $x^2 + 6x$ to make it a perfect square?

    (b) $x^2 + 6x = 91$. Find x+3

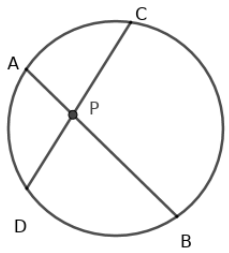
Questions from 11 to 20 carry 3 score each

11. (a) What is 1 + 2+ 3+ ... + 50 ?

    (b) What is 2 + 4+ 6+ ... + 100 ?

    (c) What is 3+ 5+ 7+ ... + 101 ?

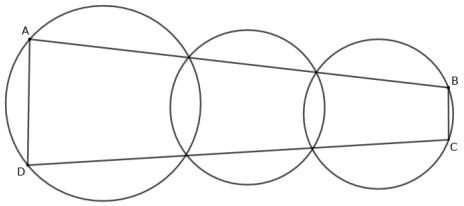
12. In the figure, PC = 8centimetres,
    PD = 6centimetres



    (a) What is the area of the rectangle with sides PA and PB?

    (b) Find PB if PA = 4centimetres?

13. In the figure, $\angle A = 70^0$.

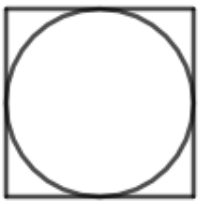


    (a) What is $\angle C$?

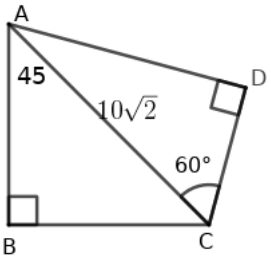
    (b) Prove that quadrilateral ABCD is cyclic.

14. Find the sides of a rectangle whose perimeter is 60 centimetres and area 216 square centimetres?

15. A circle is inscribed in a square of side 10 centimetres. If a point is marked inside the square, what is the probability that point is fallen inside the circle?



16. In figure,
AC=$10\sqrt{2}, \angle BAC = 45^0, \angle ACD = 60^0$.
Find the sides of the quadrilateral ABCD.



17. Draw the co-ordinate axes and mark the points O(0,0), A(0,4), B(2,6), C(2,2). Join OABC in order. Give suitable name for OABC.

18. The consumption of electricity of some families in a village is tabulated below. Find its median.

Consumption of electicity	No. of families
250	5
280	7
300	10
330	8
350	3
400	2

19. Draw a circle of radius 3 centimtres. Also draw two mutually perpendicular diametres in the circle. Then construct tangents at the ends of these diametres.

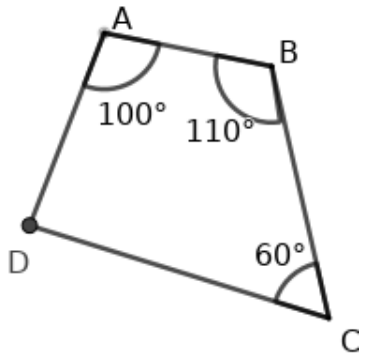
20. $p(x) = 2x^2 - 3x + 2$
    (a) What is p(1)?
    (b) Write a second degree polynomial for which x-1 is a factor.

Questions from 21 to 30 carry 4 score each

21. The algebraic expression for the sum to n terms of an arithmetic sequence is $n^2 + 2n$.
    (a) Find its first term and common difference.
    (b) Prove that one more than the sum of first any number of terms of this arithmetic sequence is a perfect square.

22. Draw a circle of radius 3.5 centimetres. Construct a triangle having two angles $50^0, 70^0$ and all corners are on the circle.

23. In quadrilateral ABCD,
$\angle A = 100^0, \angle B = 110^0, \angle C = 60^0$



(a) State the positions of corners B and D when circle is drawn with diameter AC.

(b) What about corners A and C if circle of diameter BD is drawn?

24. How many consecutive terms of the arithmetic sequence 4,10,16, ... Should be added to get 310?

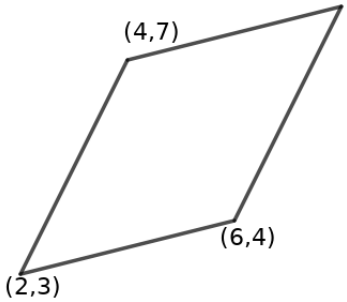
25. A(4,5), B(9,5), C(4,10) are the vertices of a triangle.

(a) Find the length of side AB?

(b) Prove that this triangle is iscoceless.

(c) Write the coordinates of its circum centre. What is the circum radius?

26. Find the coordinates of the fourth vertex of the given parallelogram. Also find the coordinates of the point of intersection of the diagonals.



27. In 10A class, 30 boys and 20 girls are there. In 10B class 25 boys and 20 girls. One student from each class is to be selected for shuttle team.

(a) What is the probability of both being girls?

(b) What is the probability of both being boys?

(c) What is the probability of one boy and one girl?

28. Draw a circle of radius 3 centimtres. Mark a point P, at a distance 7 centimetres away the centre of the circle. Then construct tangents from P to the circle.

29. Find the total surface area of the square pyramid having base edge 7 centimetres and height 12 centimetres. Find the volume of the square pyramid.

30. (a) Write the polynomial $x^2 - 4$ as the product of two first degree polynomials.

(b) Find the number k, for x-1 to be a factor of the polynomial $x^2 + kx - 4$.

Questions from 6 to 10 carry 5 score each

31. Consider the sequence of multiples of 3 in between 100 and 400.

(a) What is the first number in the sequence?

(b) How many terms are there in this sequence?

(c) Find the sum of all terms of this sequence.

32. The seventh term of an arithmetic sequence is 40 and its 13th term is 82 .

(a) What is 19th term of this sequence?

(b) what is its 10th term?

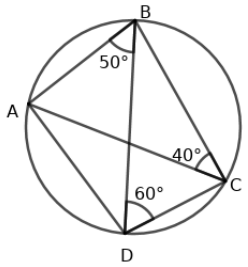
(c) Find the sum of its first 19 terms.

33. Draw a rectangle of area 15 square centimetres.Construct a square of the same area

34. A,B,C, and D are points on the circle.
$\angle ABD = 50^0$,
$\angle ACB = 40^0, \angle BDC = 60^0$

(a) What is $\angle ACD$?

(b) Find the angles of the quadrilateral ABCD.



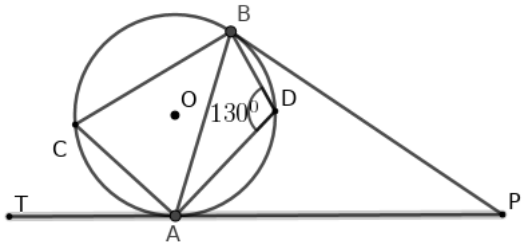
35. In figure PA and PB are tangents of circle with centre O. $\angle ADB = 130^0$ ആണ്.

(a) What is $\angle C$?

(b) Find $\angle P$.

(c) What is$\angle PAB$?

(d) Find $\angle OBP, \angle BAT$.

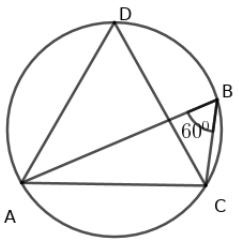


36. Construct a triangle with two angles $40^0, 60^0$ whose inradius is 3 centimetres.

37. Sum of the perpendicular sides of a right triangle is 34 centimetres and its area is 120 square centimetres. Find all the sides of the triangle.

38. The top of a tower is seen from the top and bottom of a building at angles of elevation $60^0, 30^0$ respectively. Distance between tower and building is 20 metre. Draw a rough figure. Find the height of the tower and building.

39. In figure, Circum radius is 10 centimetre.$\angle B = 60^0$, AD=DC.



(a) Find the length of AC.?

(b) What is $\angle D$?

(c) Find the area of the triangle ABC.

40. The daily wages of servants in a firm is given below.

Daily wages	No. of workers
400–500	10
500–600	17
600–700	25
700–800	14
800–900	8
900–1000	3

(a) If servants are arranged according to their wages(lower to higher), which position is taken as median ?

(b) How much is to be taken as the wage of 28th servant?

(c) What is median of wages?

41. (a) Find the length of the line joining (3,7) and (11,13).

(b) Find the coordinates of centre of the circle with this line as diameter. What is the radius of this circle.

(c) Check whether the points (5,8), (4,6), (12,10) are inside, outside or on the circle.

42. Consider the line joining (3,1) and (6,3).

(a) Find the slope of this line?

(b) Write the coordinates of another two points on this line?

(c) What is the coordinates of point of intersection of this line and x axis?

(d) Find the coordinates of point of intersection of this line and y axis.

43. (a) Find the coordinates of centre of the circle with diameter as the line joining (0,6) and (6,0.)

(b) Write the equation of this circle.

(c) Where is the position of origin with respect to this circle.

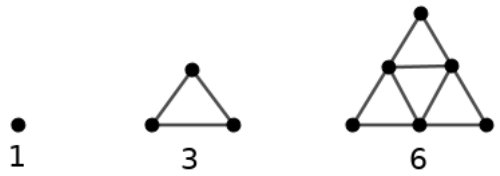
44. A circular cone has radius radius 16 centimetre and height 30 centimetre.

(a) Find its slant height.

(b) What is the total surface area?

(c) Find the volume of the cone.

45. **Read the mathematical ideas given. Then write the answers to the questions.**



1,3,6,10, ...

These numbers are known as triangular numbers since they can be arranged on the corners of trianglesas in the figure.

Similarly 1,4,9,16, ... are known as square numbers as they can be arranged in the corners of squares.

1+3 = 4

3+6 = 9

6+10 = 16

.....

Square number is obtained by adding consecutive two triangular numbers.

(a) Find the next number in the sequence 1,3,6,10, ...?

(b) Write the next number in the square number sequence 1,4,9,16, ...

(c) What is the tenth triangular number?

(d) Which triangular numbers are to be added to get square number 36.

(e) What is the nth square number?

OR

A metalic sphere of radius 12 centimetres is melted to form circular cones of radius 4 centimetres and height 6 centimetres. How many cones can be formed?