DIET KANNUR

MUKULAM PROGRAMME

SSLC MODEL EXAMINATION -2022

MATHEMATICS

Time: $2\frac{1}{2}$ **Hours** **Total Score: 80**

INSTRUCTIONS:

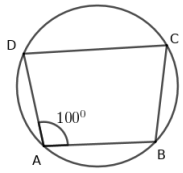
- First 15 minutes is cool-off time. You may use this time to read the questions and plan your answers.
- Attempt the questions according to the instructions,
- Keep in mind, the score and time while answering the questions.
- In each part, the questions from the focus area are given in Section A and the questions from outside the focus area in Section B.
- No need to simplify irrationals like $\pi, \sqrt{2}, \sqrt{3}$ using apporoximations unless you are asked to do so.

PART I

A. Answer any four questions from 1 to 6. Each carries 1 score. **($4 \times 1 = 4$)**

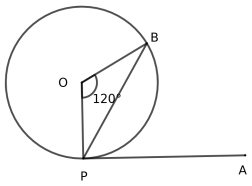
1. If the x coordinate of a point on the line passing through points (1,2) and (10,2) is 7 then what is the y coordinate?

2. In quadrilateral ABCD, $\angle A = 100^0$. What is the measure of $\angle C$?



3. There are 9 beads in a box, 6 black and the remaining white. what is the probability of getting a white from this box?

4. In figure, P and B are points on a ciclre centred at O. PA is a tangent to the circle. $\angle POB = 120^0$. What is $\angle BPA$?



5. (4,6) is a point on the line with slope $\frac{1}{2}$. If (x,7) is another point on this line, What is x?

6. p(x) = (x-1)(x-2). What is p(1)?

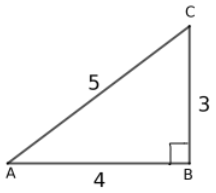
B. Answer all questions from 7 to 10.Each carries 1 score. **($4 \times 1 = 4$)**

7. The expression for sum to first n terms of an arithmetic sequence is $3n^2 + 5n$. What is its first term?

8. 1, $\frac{1}{2}$, $\frac{1}{3}$, ... is the sequence of reciprocals of natural numbers. What is its 10^{th} term? .

9. The base area of a square pyramid is 25 square centimeters and the height is 9 centimeters. What is its volume?

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

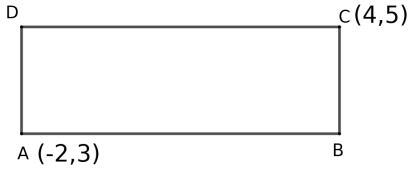


PART II

A. Answer any three questions from 11 to 15. Each carries 2 scores. **($3 \times 2 = 6$)**

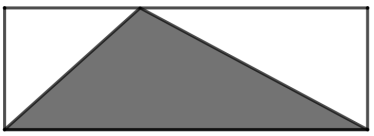
11. The daily wages of 8 workers are given below.
    700,400,300,500,800,750,400,600
    Calculate the median daily wage.

12. In figure, sides of the rectangle are parallel to the axes. Find the coordinates of other two vertices.



13. Write $x^2 - 4$ as the product of two first degree polynomials.

14. (a) Calculate the probability of a dot put in the rectangle, without looking, to be within the shaded part.
    (b) What about it to be within the non shaded part?



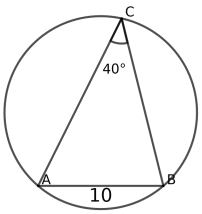
15. $p(x) = x^2 - 4x + 5$
    (a) What is P(1)?
    (b) Find the number to be subtracted from p(x) to get a polynomial for which (x-1) is a factor.

B. Answer any two questions from 16 to 18. Each carries 2 scores. **($2 \times 2 = 4$)**

16. The perimeter of a right triangle is 30 centimetres and the perpendicular sides are 5 centimetres and 12 centimetres. What is the radius of its incircle?

17. Can we write the polynomial $x^2 + x + 1$ as a product of two first degree polynomials? Why?

18. In figure AB = 10 centimetres, $\angle C = 40^0$.
What is the circumdiameter of triangleABC?
(sin40=0.64, cos40=0.76)

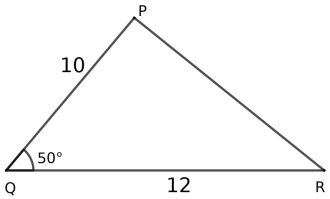


PART III

A. Answer any three questions from 19 to 23. Each carries 4 scores. **($3 \times 4 = 12$)**

19. Draw a triangle of circumradius 4 centimetres and two of the angles $50^0, 55^0$.

20. In figure, PQ = 10 centimetres,
QR=12centimetres and $\angle Q = 50^0$.
(a) What is the perpendicular distance from P to its opposite side?
(b) Find the area of the triangle.
(sin50=0.76, cos50=0.64, tan 50=1.19)



21. The length of a rectangular playground is 8 meters more than the width. The area of the playground is 84 square meters. Find the length and breadth of the playground.

22. Draw a circle of radius 3.5 centimetres. Mark a point P outside the circle at a distance 8 centimetres from the centre. Draw tangents from P to the circle. Measure the length of the tangents. .

23. A secotr of central angle 72^0 is cut out from a circle of radius 15 centimetres and is rolled up into a cone. What are the slant height and base radius of this cone? Find its curved surface area.

B. Answer any one question from 24 to 25. Each carries 4 scores. **($1 \times 4 = 4$)**

24. Draw a triangle of sides 5 centimeres, 6 centimeres, 7 centimeres and draw its incircle.

25. In class 10A, there are 20 boys and 30 girls. Among 45 students in 10B, 25 are boys. One student is to be selected from each class.
(a) How many different pairs can there be?
(b) What is the probability of both being girls?
(c) What is the probability of at least one girl?

PART IV

A. Answer any three questions from 26 to 29. Each carries 6 scores. $(3 \times 6 = 18)$

26. (a) Find 1+2+3+ ... +30.

    (b) Find 2+4+6+ ... +60.

    (c) Find 3+5+7+ ... +61.

    (d) Find 7+11+15+ ... + 123.

    (e) Find 31+32+33+ ... +60.

27. A boy standing at the edge of a canal sees the top of a tree at an elevation of 45^0. Stepping 10 metres back, he sees it at an elevation of 30^0. Draw a rough figure. How wide is the canal and how tall is the tree?

28. (a) Draw the coordinate axes and mark the points A(3,3),B(-3,3), C(-3,-3) and D(3,-3). Join A,B,C,D.

    (b) What is the length of one side of the square drawn by joining the midpoints of the sides of the square ABCD?

29. (a) What is the volume of a metal sphere of radius 12 centimetres?

    (b) By melting it and recasting, how many cones of base radius 6 centimetres and height 12 centimetres can be made?

B. Answer any two questions from 30 to 32. Each carries 6 scores. $(2 \times 6 = 12)$

30. The table below shows, children of a class sorted according to their scores in an examination.

Scors	Number of Children
0–20	7
20–40	11
40–60	10
60–80	9
80–100	8

    (a) If the children are arranged in the ascending order of their scores, then what will be the assumed score of the 19^{th} children?

    (b) Compute the median score?

31. (a) P is the point which divide the line joining the points (2,3) and (14,12) in the ratio 2:1. Find the coordinates of P.

    (b) A circle of radius 5 cm is drawn with centre at P . Find the equation of the circle. Check whether the circle passes through the points (14,12) and (2,3).

32. (a) The perimeter of a rectangle is 42 metres and its diagonal is 15 metres. What are the length of its sides?

(b) Can a recatngle of perimeter 42 metres and diagonal 15 metres be made? Why?

PART V

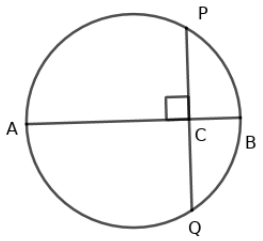
A. Answer any two questions from 33 to 35. Each carries 8 scores. **($2 \times 8 = 16$)**

33. (a) What is the common difference of the arithmetic sequence 8,14,20, ...? Write the algebraic expression of this sequence.

(b) What is the 20^{th} term of this sequence?. Find the sum of its first 20 terms.

(c) What will be the position of 152 in this sequence? Find the sum of first 49 terms of this sequence..

34. In, figure AB is the diameter and chord PQ is perpendicular to AB. AB and PQ intersects at C. AB = 9 centimetres and AC = 6 centimetres.



(a) What is the length of BC?

(b) Find CP. What is the length of chord PQ?

(c) Draw a rectangle of area 18 square centimetres. Draw a square of the same area.

35. (a) The coordinates of three vertices of parallelogram ABCD are A(4,5), B(8,7), C(6,9). Find the coordinates of D.

(b) Find the length of its diagonals.

(c) What are the coordinates of the point of intersection of its diagonals.

(d) Find the slope of the sides of the parallelogram.