SSLC PRE-MODEL EXAMINATION, MARCH - 2025
MATHEMATICS
(English)

Time : 2½ Hours **Total Score : 80**

Instructions :

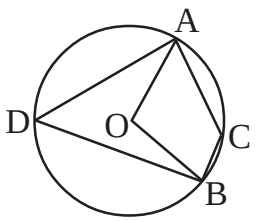
- Read each question carefully before answering.
- Give explanations wherever necessary.
- First 15 minutes is cool-off time. You may use this time to read the questions and plan your answers.
- No need to simplify irrationals like $\sqrt{2}$, $\sqrt{3}$, π etc., using approximations unless you are asked to do so.

Answer any three questions from 1 to 4. Each question carries 2 scores.

1. Sum of five consecutive terms of an arithmetic sequence is 75 and its fifth term is 19.
   a) What is the third term of this sequence?
   b) What is the common difference?

2. $(x - a)$ and $(x - b)$ are two first degree factors of the polynomial $x^2 - 7x + 10$.
   a) $a + b$ = _____
   b) $a \times b$ = _____

3. In the figure, 'O' is the centre of the circle and $\angle ACB = 80^0$
   a) $\angle ADB$ = _____
   b) $\angle AOB$ = _____



4. Marks of 5 students in a examination is given below
   72, 68, 54, 46, 80
   a) Find the mean.
   b) Find the median.

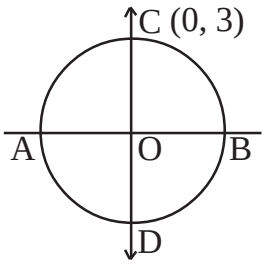
Answer any four questions from 5 to 10. Each question carries 3 scores.

5. Draw the coordinate axes and mark the points A(3, 4), B(–3, 4), C(4, –4). What is the distance between A and B.

6. The length of a rectangle is 6 cm more than its breadth. It's area is 1216 cm^2.
   a) Taking breadth as 'x', write are in terms of 'x'?
   b) Find the breadth.

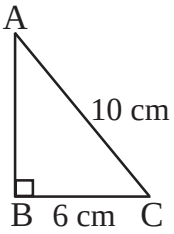
7. Draw a circle of radius 3 cm. Mark a point P at a distance 7.5 cm from the centre of the circle. Draw tangents from P to the circle.

8. In the figure, AB and CD are diameters of the circle. Coordinates of C is (0, 3). Write the co-ordinates of A, B, and D.



9. Consider the arithmetic sequence 1, 4, 7, ...
   a) What is the common difference of the sequence.
   b) Write algibric form of the sequence.
   c) Find 25^{th} term of the sequence?

10. In the figure $\angle B = 90^0$, BC = 6 cm, AC = 10 cm
   a) What is the length of AB?
   b) tan A = _____
   c) tan A × tan C = _____



Answer any eight questions from 11 to 21. Each question carries 4 scores.

11. A bag contains 10 blue balls and 12 yellow balls. Another contains 15 blue and 7 yellow balls.
   a) What is the probability of getting a yellow ball from the first bag?
   b) What is the probability of getting a yellow ball from the second bag?
   c) If all balls are put in a single bag, what is the probability of getting a yellow ball from it?

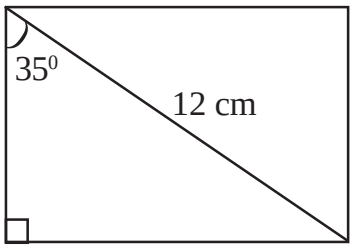
12. Draw a rectangle of area 15 cm^2. Draw a square of the same area.

13. $2x + 1$, $4x - 1$, $5x + 1$ ..... are in an arithmetic sequence.
   a) Find x ?
   b) Write the algebraic expression of the sequence.
   c) Find the position of 195 in this sequence.

14. A(1, 3), B(2, 5) are two points on a line.
   a) Find the slope of line.
   b) Write the equation of the line.
   c) Find the coordinate of the point, which the above line cuts the 'y' axis.

15. From a circle of radius 25 cm, a sector of central angle 288^0 is cut out and rolled up to make a cone.
   a) What is the slant height of the cone?
   b) What is the base radius of the cone?
   c) Find the height of the cone?
   d) Find the volume of the cone?

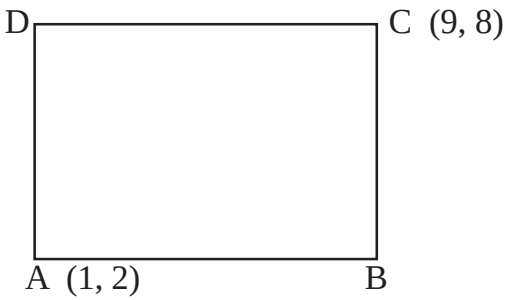
16. The diagonal of a rectangle is 12 cm and it makes an angle 35^0 with one side.



a) Find length of sides.

b) Find the perimeter of the rectangle. (Sin 35^0 = 0.57, Cos 35^0 = 0.82)

17. In the rectangle, its sides are parallel to the axes.



a) Find the coordinates of the remaining two vertices. B and D.

b) Find the length of its one diagonal.

c) Find the coordinates of the centre of its circum circle.

18. a) What number is to be added to $x^2 + 6x$ to get a perfect square.

b) If $x^2 + 6x = 315$, Find the national number represented by 'x'.

19. $P(x) = x^2 - 5x + 9$

a) Find P(2), P(3).

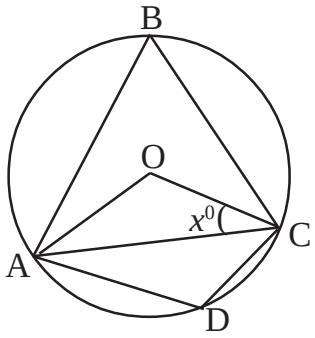
b) Write $P(x) - P(2)$ as the product of two first degree polynomial.

20. The radius of a solid metal sphere is 6 cm.

a) Find the volume of the sphere.

b) This sphere is melted and recast into a solid cone of radius 6 cm. find the height of the cone.

21.



'O' is the centre of the circle and $\angle OCA = x^0$

a) Prove that $\angle OCA + \angle ABC = 90^0$.

b) Prove that $\angle ADC - \angle OCA = 90^0$.

Answer any six questions from 22 to 29. Each questions carries 5 scores.

22. In triangle ABC, AB = 6 cm, BC = 8 cm, $\angle B = 70^0$. Draw its incircle and measure its inradius.

23. The following table shows the wages of 67 workers in a locality.

Wages	No. of workers
200 - 300	3
300 - 400	15
400 - 500	25
500 - 600	14
600 - 700	8
700 - 800	2

a) Which position is taken as median?

b) What will be the assumed wage of the 19^{th} worker?

c) Calculate the median of daily wages.

24. A boy standing on the top of a tower, sees the top of a building at an angle of depression 40^0. He sees the base of the building at an angle of depression 50^0. The distance between the tower and the to building is 40 meters.

a) Draw a rough figure based on the given details.

b) Find the height of the tower?

c) Find the height of the building.

25. Consider an arithmetic sequence whose 6^{th} term is 40 and 9^{th} term is 58.

a) Find 25^{th} term of this sequence.

b) Find the sum of first 25 terms of the sequence.

c) Find the sum of first 'n' terms of the sequence.

26. The lateral faces of a square pyramid are equilateral triangle with sides 30 cm.

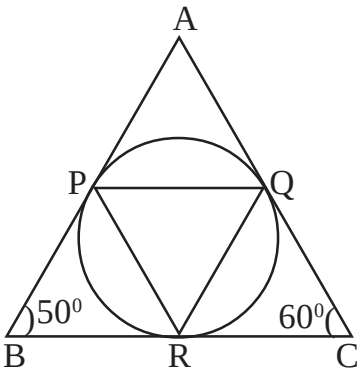
a) Find the length of base edge.

b) Find the slant height of the square pyramid.

c) Find the lateral surface area of the square pyramid.

d) Find the volume of the square pyramid.

27. In the figure, the incircle of the triangle ABC touches the triangle at the points P, Q and R.



a) $\angle A$ = _____

b) $\angle BPR$ = _____

c) Find all angles of $\angle PQR$.

28. Consider the points A (3, 2) and B (7, 10)

a) Find the coordinates of the centre of the circle having diameter AB.

b) Find the radius of the circle.

c) Write the equation of the circle.

d) Prove that, the circle passes through the point (9, 4).

29. Look at the following Sequences.

Sequence 1 : 1, 2, 4, 8, ...

Sequence 2 : 1, 3, 9, 27, ...

In sequence 1, the next term is obtained by multiplying all the numbers by 2. Similarly, In sequence 2, the next term is obtained by multiplying all the terms in by 3. Multiplying the first term 1 by 3 gives the second term and multiplying second term 3 by 2 times (3^2) gives the third term 9 etc.

A series in which all the terms are multiplied by a fixed number to get the next term is called a Geometrical Sequence. A fixed number that is multiplied is called a common ratio. Find the answers to the following questions?

a) What is the next term in the sequence 1, 2, 4, ...?

b) What is the next term in the sequence 1, 3, 9, 27, ...?

c) What is the common ratio of the sequence 2, 6, 18, ... ?

d) How many terms are there in the sequence 1, 2, 4, ... is 64 ?

e) 1, 3, 9, ... How many times in this sequence can 1 be multiplied by 3 to get the 10^{th} term of the sequence?