SSLC PRE MODEL EXAMINATION 2022 - 23

Time : 2½ Hours

MATHEMATICS

(English)

Total Score : 80

General Instructions to candidates :

- *The First 15 minutes is the cool-off time. You may use the time to read and plan your answers.*
- *Answer the questions only after reading the instructions and questions thoroughly.*

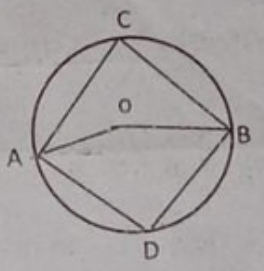
Answer any three questions from 1 to 4 each question carries 2 scores.

1. Common difference of an arithmetic sequence is -1 and the fifth term is 15.
   a. What is the fifteenth term of the sequence?
   b. Which term of this sequence is 0?

2. Write the coordinates of the point dividing the line joining the points A (-2,4), B (3,-6) in the ratio 2:3.

3. Write x^2-2 as the product of two first degree polynomials.

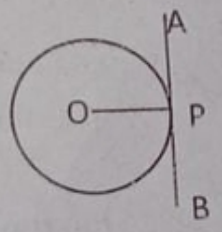
4. A, B, C, and D are points on a circle with centre O.
   $\angle D = \angle AOB$. Write the measures of $\angle D$ and $\angle C$.



Answer any four questions from 4 to 10. Each question carries 3 scores.

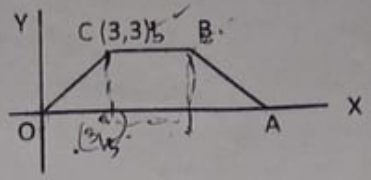
5. Algebraic form of an arithmetic sequence is 16 – 2n.
   a. What is the common difference of the sequence?
   b. Write the 9th term.
   c. Find the sum of first 17 terms.

6. In the figure O is the centre of the circle. P is a point on the circle. AB is a tangent.
   a. What is the measure of $\angle OPA$?
   b. Draw a circle of radius 3cm. Draw a tangent of the circle.



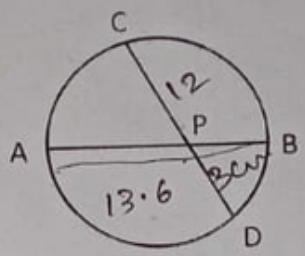
7. n^{th} term of an arithmetic sequence is 2n-1. Sum of first 2n-1 terms of this sequence is 289. What number is n?

8. In the figure OABC is an isosceles trapezium. CB=5. Coordinates of C is (3,3). Write the coordinates of O, A and B.



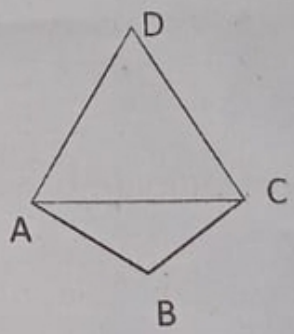
9. A semicircle of radius 12cm is rolled up into a cone.
   a. What is the slant height of the cone?
   b. Find the radius of the cone.

10. In the figure AB =13.6 cm. PC = 12 cm, PD = 3cm
   a. What is PA x PB ?
   b. Find the length of PA.



Answer any eight questions from 11 to 21. Each question carries 4 scores **(8x4=32)**

11. ABCD is a cyclic quadrilateral. ∠B=120°. AC = 8 cm
   a. What is the measure of ∠D?
   b. Find the radius of the circumcircle of quadrilateral ABCD.



12. Base Perimeter of a solid square pyramid is 72cm and the slant height is 15cm.
   a. What is the length of a base edge?
   b. Find the volume of the pyramid.
   c. It is melted and recast into cubes of volume 1 cubic centimeter. How many cubes will get?

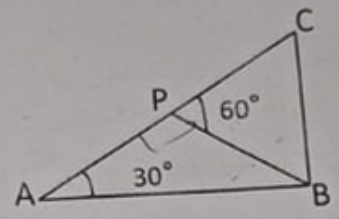
13. a. Find the slope of the line joining the points A (2, 6) and B (7, 11)
   b. Write the equation of the line.
   c. Write the coordinates of the point of intersection of AB and the x-axis.

14. a. What is the common difference of the arithmetic sequence $2x, 4x, 6x, \ldots, \ldots, \ldots$?

b. Write the fifteenth term of this sequence

c. Write the nth term and the sum of first n terms of the sequence.

15. In triangle ABC $\angle ABC = 90°$. $\angle A = 30°$, $\angle CPB = 60°$.

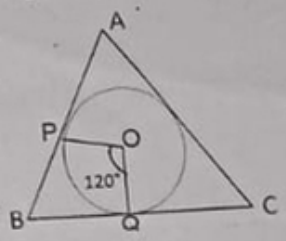


a. What is the measure of $\angle APB$?

b. Write the ratio of the angles of ΔAPB.

c. Find the ratio of the lengths of the sides of the triangle APB.

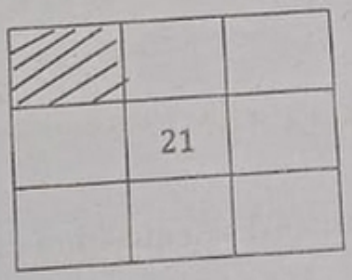
16. In the figure, O is the centre of the incircle of triangle ABC. $\angle POQ = 120°$



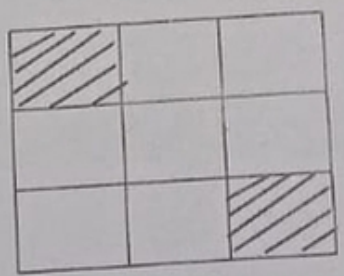
a. What is the measure of $\angle B$?

b. Draw a circle and draw an equilateral triangle with all its sides touching the circle.

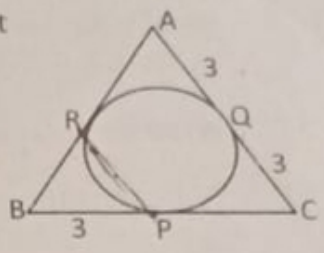
17. a. Given below is a square containing 9 adjacent numbers of a calendar. If the middle number is 21. Which is the number in the shaded square?



b. Similarly in a square containing 9 numbers in a calendar, product of the numbers in the shaded square is 336. Find the middle number.



18. In the figure, sides of the triangle ABC touches the circle at P, Q and R. AQ = QC=PB=3cm.



a. What is the length of BR?

b. Write the length of PR.

c. Find the perimeter of triangle PQR.

19. A box contains 6 red beads and 4 white beads. Another box contains 4 red beads and 6 white beads. If a bead is taken from each,

a. What is the number of possible pairs?

b. What is the probability of both beads being red?

c. What is the probability of getting a red bead and a white bead?

d. What is the probability of getting at least one red bead?

20. Draw x and y axes. Mark the point P (3,4). Draw a circle touching the x axis, with center P.

a. What is the radiusof the circle?

b. Write the coordinates of the touching point of the circle and the x axis.

21. $P(x) = x^2 - 4x + 7$

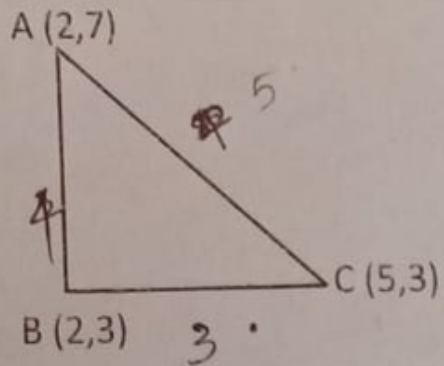
a. Find P (1) and P (3)

b. Write P(x) – P(1) as the product of two first degree polynomials.

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

(6x5=30)

22. A (2, 7), B (2,3), C (5,3) are the vertices of triangle ABC



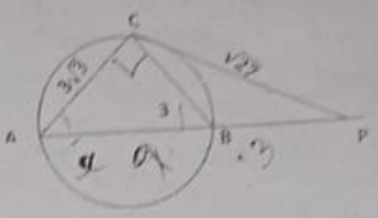
a. What is the length of AC ?

b. Write the coordinates of the centre of the circumcircle of triangle ABC.

c. Write the equation of the circle.

23. AB = 6cm, BC = 6.5cm, AC = 7cm. Draw the triangle ABC. Draw its incircle. Measure and write the inradius.

24. The chord AB is extended to meet the tangent through C at P.
AC = $3\sqrt{3}$ cm, BC = 3cm, PC = $\sqrt{27}$ cm.



a. What is PA x PB?

b. Find the length of PA and PB.

25. When the sun is at an elevation 35° the shadow of a tree is 10 metres. What would be the length of the shadow of the same tree, when the sun is at an elevation of 45°? (sin35 = 0.57, cos35 = 0.82, tan35 = 0.70)

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

Score	No. of students
0-8	8
8-16	10
16-24	16
24-32	4
32-40	2
Total	40

a. If the children are arranged in the ascending order of their scores, then what will be the assumed score of the 19th child?

b. Compute the median score.

27.

1

2 3 4

5 6 7 8 9

. . . . .

. . . . .

a. Write the fourth line of this number pyramid.

b. What is the last number of the tenth line?

c. Find the sum of all numbers in the tenth line.

28. Height of a wooden cube is 12cm.

a. What is the radius of the largest sphere that can be carved out from the cube? Find its volume.

b. Find the volumes of the cone and the cylinder that can be carved out from cubes of height 12cm.

29. Read the following passage. Understand the mathematical concept in it and answer the questions that follow.

Sum of the first three terms of an arithmetic sequence is one and the sum of its first six terms is 3.

That is $x_1+x_2+x_3=1$ and $x_1+x_2+x_3+\ldots\ldots+x_6=3$

Then $x_4 + x_5 + x_6 = 2$, and $x_2 = \frac{1}{3}$, $x_3 = \frac{2}{3}$.

Then the common difference is $\frac{x_3 - x_2}{3} = \frac{\frac{2}{3} - \frac{1}{3}}{3} = \frac{1}{9}$

First term is $\frac{1}{3} - \frac{1}{9} = \frac{2}{9}$

That is the sum of the first 3 terms of the arithmetic sequence

$\frac{2}{9}, \frac{3}{9}, \frac{4}{9}$ ..... is 1 and the sum of the first 6 terms is 3.

a. What is the fourth term of the arithmetic sequence $\frac{2}{9}, \frac{3}{9}, \frac{4}{9}$ .....

b. Find the sum of first 9 terms of the sequence.

c. $x_7 + x_8 + x_9 =$ _____

d. $x_{298} + x_{299} + x_{300} =$ _____

e. What is the sum of first 300 terms of the arithmetic sequence $\frac{2}{9}, \frac{3}{9}, \frac{4}{9}$ .....?

-oOo-