(Pages : 8 + Graph Sheet)

ME 127

Sl. No.

SSLC MODEL EXAMINATION, MARCH - 2022

MATHEMATICS

(English)

Time : 2½ Hours

Total Score : 80

General Instructions to Candidates :

- There is a 'Cool-off-time' of **15** minutes in addition to the writing time. Use this time to get familiar with questions and plan your answers.
- Questions with different scores are given as distinct parts.
- Read the instructions carefully before answering the questions.
- Keep in mind, the score and time while answering the questions.
- The maximum score for questions **1** to **35** will be **80**.
- No need to simplify irrationals like $\sqrt{2}$, $\sqrt{3}$, π etc, using approximations unless you are asked to do so.

Score

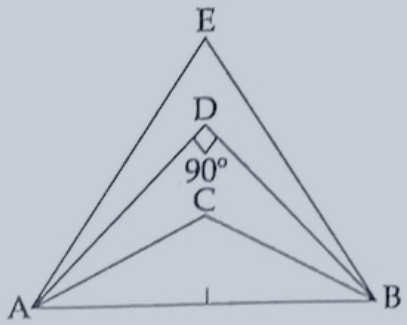
PART - I

Questions from 1 to 10 carries 1 score each.

(A) Answer any four questions from 1 to 6. 4x1=4

1. Write the first three terms of the arithmetic sequence with first term 6 and common difference 4. 1

2. 1



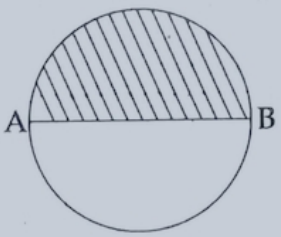
Suppose we draw a circle with AB as diameter. Among the points C, D, E which lies on the circle ?

3. A line parallel to x-axis passes through the point (2, 1). Find the co-ordinates of the point on this line intersecting with y-axis. 1

P.T.O.

Score

4. 1



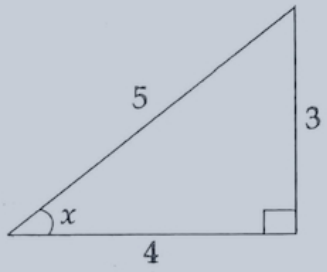
In the figure, AB is the diameter of the circle. Calculate the probability of a dot put inside the circle, without looking, to be within the non-shaded region.

5. The radii of two hemispheres are in the ratio 1 : 2. What is the ratio of their surface areas ? 1

6. $p(x) = x^2 + 2x$. Find the number to be subtracted from $p(x)$ to get a polynomial for which $x - 1$ is a factor ? 1

(B) Answer all questions from 7 to 10. Choose the correct answers from the bracket. 4x1=4

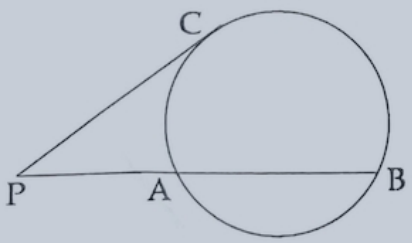
7. 1



From the figure, which among the following is tan x ?

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

8. 1



In the figure chord BA extended and the tanget at C meet at P. PA = 4 centimetres and PB = 9 centimetres. What is the area of the square with side PC ?

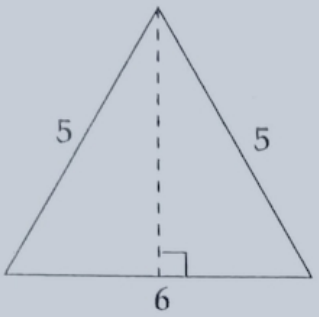
$\left[6,\ 36,\ 13,\ \sqrt{6}\right]$

Score

9. The equation of a line is $y = 2x$. Which of the following is not a point on this line ? 1

$\left[(1, 2); (5, 10); \left(\frac{1}{2}, 1\right); (3, 1)\right]$

10. 1



The figure shows one lateral face of a square pyramid. Its sides are 5 centimetres, 5 centimetres and 6 centimetres. What would be the slant height of square pyramid in centimetre ?

[3; 4; 5; 6]

PART - II

Questions from 11 to 18 carries 2 score each. 3x2=6

(A) Answer any three questions from 11 to 15.

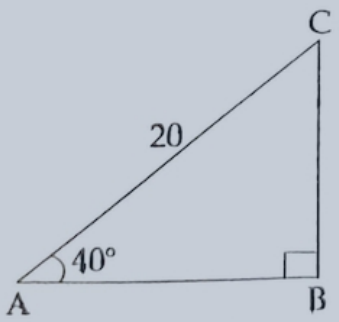
11. The sum of first seven terms of an arithmetic sequence is 84. Find its 4^{th} term. 2

12. A box contains 3 red balls and 6 green balls.

(a) What is the probability of getting a red ball from this box ? 1

(b) How many more red balls should be added so that the probability of getting a red ball is $\frac{1}{2}$? 1

13. 2



In right triangle ABC, $\angle A = 40°$ and $AC = 20$ centimetres. Calculate the length of the side BC.

(sin 40 = 0.64; cos 40 = 0.76)

Score

14. Write the polynomial $x^2 - \frac{1}{4}$ as the product of two first degree polynomials. 2

15. The scores of 10 students in an examination are given below. 2
30, 28, 25, 32, 20, 36, 24, 33, 27, 38. Calculate the median score.

(B) **Answer any two questions from 16 to 18.** 2x2=4

16. The expression for the sum of first 'n' terms of an arithmetic sequence is $2n^2 + 4n$. 2
Find the first term and common difference of this sequence.

17. Find the radius of the incircle of a triangle with perimeter 42 centimetres and area 84 square centimetres. 2

18. Find the equation of the circle with centre at the origin and radius 5. 2

PART - III

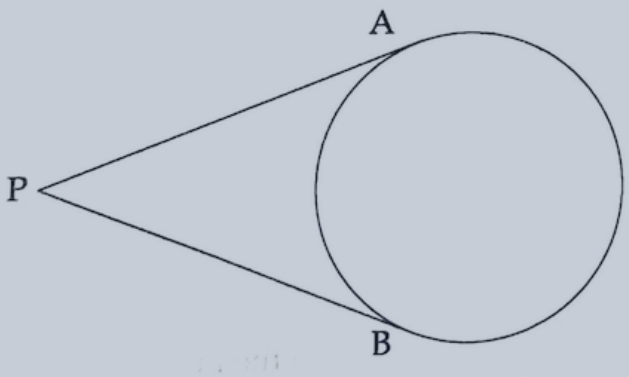
Questions 19 to 25 carries 4 score each.

(A) **Answer any three questions from 19 to 23.** 3x4=12

19. Draw a rectangle of sides 4 centimetres and 3 centimetres. Draw a square of area equal to the area of this rectangle. 4

20. A rectangle is to be made with perimeter 60 metres and area 189 square metres. What should be the length of its sides ? 4

21.



(a) Tangents at the points A, B on the circle meet at P. If PA = 5 cm, what is PB ? 1

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

Score

22.

(a) What are the co-ordinates of the fourth vertex of the parallelogram ? 2

(b) What are the co-ordinates of the point of intersection of its diagonals ? 2

23. From cube of side 6 centimetres, the largest sphere is carved out.

(a) What is the volume of the sphere ? 3

(b) This sphere is cut into two equal halves. What is the volume of one hemisphere ? 1

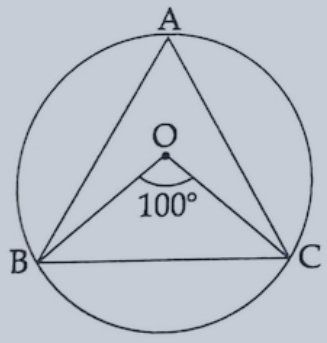
(B) **Answer any one question from 24 and 25.** **1x4=4**

24. Natural numbers from 1 to 10 are written on paperslips and are put in a box. Another box contains paperslips with numbers less than 10 which are multiples of 3. One slip is taken from each box.

(a) What is the probability of both being odd ? 3

(b) What is the probability of getting at least one even ? 1

25.



In figure, radius of the circle with centre O is 7 centimetres. $\angle BOC = 100°$.

(a) Find $\angle A$. 1

(b) Find the length of BC. 3

(sin 50 = 0.76; cos 50 = 0.64; tan 50 = 1.19)

P.T.O.

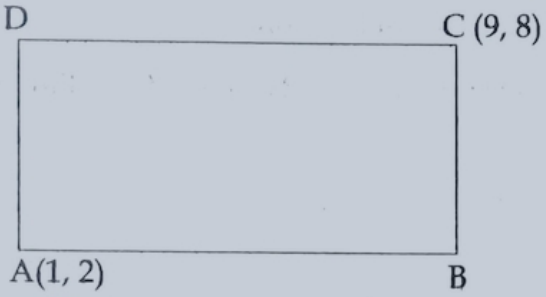
Score

PART - IV

Questions from 26 to 32 carries 6 score each.

(A) Answer any three questions from 26 to 29. 3x6=18

26.



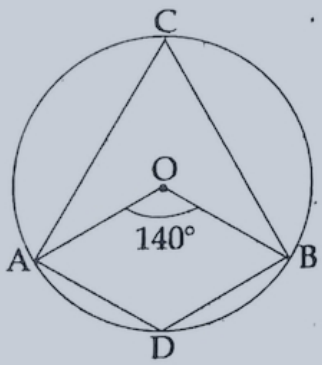
In the rectangle shown above, its sides are parallel to the axes.

(a) Find the co-ordinates of the remaining two vertices of the rectangle. 2

(b) Find the length of its one diagonal. 2

(c) Find the co-ordinates of the centre of its circumcircle. 2

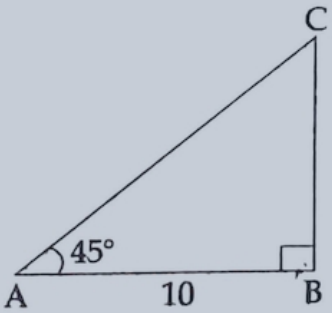
27.



(a) In figure, A, B, C, D are points on the circle with centre O. $\angle AOB = 140°$. Find the measures of $\angle ACB$ and $\angle ADB$. 2

(b) Draw a triangle of circumradius 3.5 centimetres and two angles 50° and 70°. 4

28.



(a) In the figure $\angle A = 45°$, $\angle B = 90°$, AB = 10 centimetres. What is the length of AC? 1

(b) A boy sees the top of a tower at an elevation of 60°. Stepping 20 metres back, he sees it at an elevation of 30°. Find the height of the tower. 5

Score

29. From a circular metal sheet of radius 30 centimetres, a sector of central angle 120° is cut out and made into a cone.

(a) What are the slant height and base radius of this cone ? 2

(b) Calculate the area of the curved surface of this cone. 2

(c) What would be the radius of the cone that can be made by rolling up the remaining sector ? 2

(B) Answer any two questions from 30 to 32. 2x6=12

30. (a) Find $1+2+3+\ldots\ldots+10$. 2

(b) How many consecutive natural numbers starting from 1 should be added to get 300 ? 4

31. $p(x)=x^2-5x+6$.

(a) Find $p(2)$. 2

(b) Write $p(x)$ as the product of two first degree polynomials. 2

(c) Find the solutions of the equation $x^2-5x+6=0$. 2

32. The daily wages of workers in a firm is given below.

Daily wages	No. of workers
500 - 600	5
600 - 700	7
700 - 800	10
800 - 900	8
900 - 1000	5
Total	**35**

(a) If workers are arranged according to their wages (lower to higher).

(i) Which position is taken as median ? 1

(ii) What will be the assumed wage of the 13^{th} worker ? 2

(b) Calculate the median of daily wages. 3

Score

PART - V

Questions from 33 to 35 carries 8 score each.

(A) Answer any two questions from 33 to 35. 2x8=16

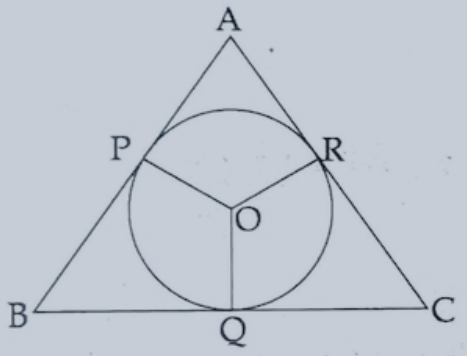
33. (a) Consider the arithmetic sequence 4, 7, 10, ... what is the algebraic expression for this sequence ? 2

(b) Write the 20^{th} term of this sequence. What is the smallest three digit number which is a term of this sequence ? 2

(c) Find the sum of first 20 terms of this sequence. 4

What is the difference between the sum of first 20 terms of this sequence and sum of first 20 terms of the arithmetic sequence with algebraic form $3n+2$.

34.



(a) In figure, the incircle of triangle A, B, C touches its sides at the points P, Q and R. O is the centre of the circle. 4

(i) Find $\angle OQB$.

(ii) Examine whether quadrilateral POQB is cyclic.

(iii) If $\angle B = 50°$, then $\angle POQ =$ _____.

(b) Draw a triangle with radius of the incircle 2.5 centimetres and two angles $50°$, $60°$. 4

35. (a) Draw the x and y axis. Mark the points (1, 2) and (3, 5). 3

(b) Find the slope of the line, passing through the points (1, 2) and (3, 5). 2

(c) The x co-ordinate of a point on this line is 21. What is its y co-ordinate ? 3

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