



Time : 2 ½ Hours

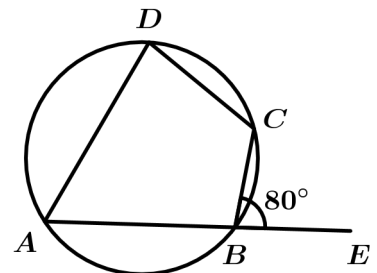
MATHEMATICS

Total Score : 80

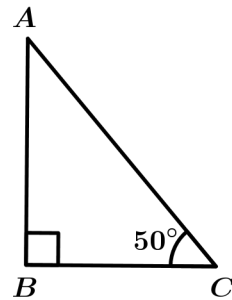
PART - I
Section : A

Answer any four questions from 1 to 6. Each carries 1 score (4 x 1 = 4)

1. What is the tenth term of the arithmetic sequence 6 , 11 , 16 , . . . ?
48 , 49 , 50 , 51
2. What number is to be added to $x^2 + 6x$ to get a perfect square ?
4 , 9 , 16 , 36
3. Radius of a hemisphere is 10 centimetres . What is its surface area (in square centimetre)?
 100π , 200π , 300π , 400π
4. In the figure $\angle CBE = 80^\circ$.What is the measure of $\angle ADC$?
[50° , 80° , 100° , 130°]



5. In triangle ABC, $\angle B = 90^\circ$, $\angle C = 50^\circ$.
Which of the following is $\tan 50^\circ$?
[$\frac{AB}{AC}$, $\frac{BC}{AC}$, $\frac{BC}{AB}$, $\frac{AB}{BC}$]



6. Which of the following is a point on the y-axis ?
[(1 ,0) , (1 , 1) , (0,1) , (2 , 2)]

Section : B

Answer all questions from 7 to 10 . Each carries 1 score (4 x 1 = 4)

7. The sum of the first n terms of an arithmetic sequence is $n^2 + 2n$.
What is its common difference ?
[1 , 2 , 3 , 4]
8. The base perimeter of a square pyramid is 40 centimetres and its slant height is 10 centimetres. What is its lateral surface area (in square centimetres)?
[100 , 200 , 300 , 400]
9. What are the coordinates of the point at which the line $x + y = 1$ cuts the x-axis?
[(0,0) , (1 , 0) , (0,1) , (1 , 1)]

10. The hypotenuse of a right triangle is 10 centimetres and the radius of its incircle is 2 centimetres . What is the area of the triangle (in square centimetres) ?

[20 , 24 , 25 , 40]

PART - 2

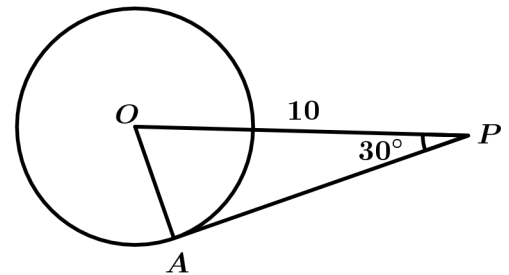
Section : A

Answer any three questions from 11 to 15 . Each carries 2 scores .
(3 x 2 = 6)

- 11. Write $x^2 - 4$ as the product of two first degree polynomials .
- 12. The weights of 13 members of a cricket club in a school are given .
 36 , 42 , 30 , 38 , 46 , 32 , 44 , 34 , 40 , 41 , 39 , 45 , 33 (in kilograms) .
 Find the median weight .
- 13. Third term of an arithmetic sequence is 16 and its 8th term is 41 .
 (a) What is its common difference ?
 (b) What is its 7th term?
- 14. Each letter of the word " MALAYALAM " is written on paper slips and put in a box
 A slip is to be drawn from it .
 (a) What is the probability of getting the letter A ?
 (b) What is the probability of not getting the letter A ?
- 15. In the figure O is the centre of the circle . P is a point 10 centimetres away from O .

PA is a tangent . $\angle OPA = 30^\circ$

- (a) What is the measure of $\angle OAP$?
- (b) What is the length of the tangent ?



Section : B

Answer any two questions from 16 to 18. Each carries 2 scores .
(2 x 2 = 4)

- 16. The base edge of a square pyramid is 10 centimetres and its height is 12 centimetres. What is its volume ?
- 17. (3 , 4) is a point on the circle and the centre of the circle is the origin .
 (a) What is the radius of the circle?
 (b) Write the equation of the circle.
- 18. Algebraic form of an arithmetic sequence is $2n + 1$. What is the sum of the first **n** terms of this sequence ?

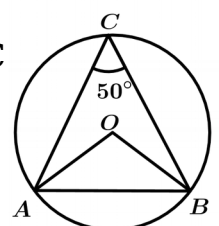
PART - 3

Section : A

Answer any three questions from 19 to 23. Each carries 4 Scores.
(3 x 4 = 12)

19. In the figure O is the centre of the circumcircle of the triangle ABC
 $\angle C = 50^\circ$

- (a) What is the measure of $\angle AOB$?
- (b) Draw a triangle of circum radius 3 cm and two of the angles 50° and 70° .



20. The sum of the square of a number and 6 times that number is 160 .
 (a) Write down a second degree equation to find the number .
 (b) What is the number ?
21. Draw a circle of radius 3 centimetres and mark a point 7 centimetres away from its centre .
 Draw the tangents to the circle from this point. Measure the length of the tangents .
22. One is asked to say a two -digit number .
 (a) How many two digit numbers are there ?
 (b) What is the probability of getting a multiple of 10 ?
 (c) What is the probability of one of the digit being zero and the other being prime ?
23. When sun is seen at an elevation of 60° , the length of the shadow of a tree is 10 meters.
 (a) Draw a rough figure based on the given details?
 (b) What is the height of the tree ?
 (c) What would be the length of the shadow of the same tree, when the sun is at an elevation of 30° ?

Section : B

Answer any one question from 24 to 25. Each carries 4 scores. (1 x 4 = 4)

24. If $p(x) = x^2 - 4x + 3$
 (a) Find $p(1)$.
 (b) Check whether $x-3$ is a factor of $p(x)$ or not.
 (c) Write $p(x)$ as the product of two first degree polynomials.
25. Draw a triangle of sides 4 centimetres, 5 centimetres, 6 centimetres and draw its incircle. Calculate its radius .

PART - 4

Section : A

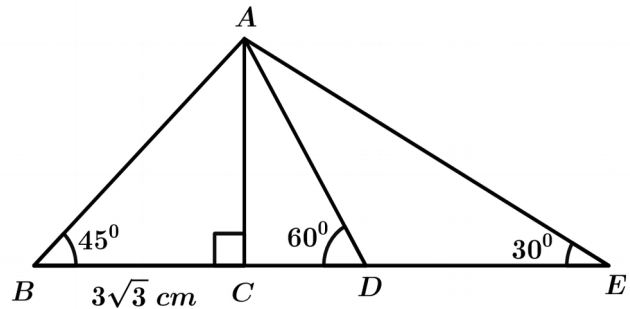
Answer any three questions from 26 to 29 .Each carries 6 scores . (3 x 6 = 18)

- 26.(a) Write down the sequence of two digit numbers which leave a remainder 2 on division by 5 .
 (b) What is the common difference of this sequence
 (c) What is the largest number of this sequence?
 (d) How many numbers are there in this sequence?
 (e) Find the sum of the numbers of this sequence.
27. The vertices of a triangle are $A(3, 5)$, $B(9, 13)$ and $C(10, 6)$.
 (a) Calculate the length of the sides of the triangle .
 (b) What are the coordinates of the midpoint of the side AB ?
 (c) What is the perpendicular distance from the vertex C to the side AB ?
 (d) Calculate the area of the triangle .
28. A cone of maximum volume is carved out from a solid metal cylinder of base radius 6 centimetres and height 20 centimetres .
 (a) What is the volume of the cylinder ?
 (b) What is the volume of the cone ?
 (c) What is the volume of the remaining portion of the cylinder ?

(d) The remaining portion of the cylinder is melted and recast in to small spheres of radius 2 centimetres . What is the number of spheres so obtained ?

29. In the figure $BC = 3\sqrt{3} \text{ cm}$, $\angle ABC = 45^\circ$, $\angle ACB = 90^\circ$, $\angle ADC = 60^\circ$, $\angle AED = 30^\circ$.

- What is the measure of $\angle BAC$?
- What are the lengths of AC , AD and AE ?
- What is the measure of $\angle DAE$?
- What is the perimeter of the triangle ADE ?



Section : B

Answer any two questions from 30 to 32. Each carries 6 scores. (2 x 6 = 12)

30. The table below shows the workers in a factory sorted according to their daily wages .

Daily wages (Rs)	Number of workers
400 - 500	7
500 - 600	8
600 - 700	10
700 - 800	9
800 - 900	5
900 - 1000	4

- How many workers are there in the factory ?
 - If the workers are arranged in increasing order of daily wage , the daily wage of the worker at what position is taken as the median ?
 - If the workers are arranged in increasing order of daily wage , what is the daily wage of the worker at the 16th position ?
 - Find the median daily wage ?
31. (a) Draw a rectangle of width 5 centimetres and height 4 centimetres .
 (b) Draw a rectangle of the same area with width 6 centimetres .
32. (a) Draw a square of side 4 centimetres .
 (b) Draw a rectangle of the same area with width 7 centimetres .

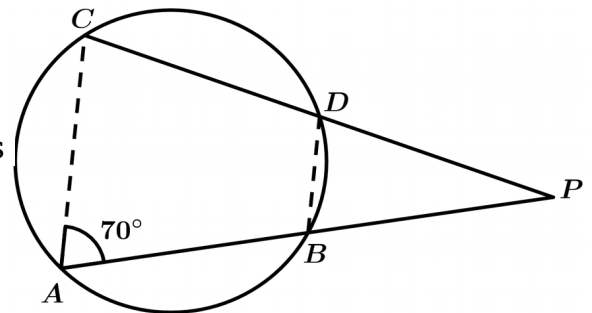
PART - 5

Answer any two questions from 33 to 35. Each carries 8 scores. (2 x 8 = 16)

33.(a) Draw x , y axes and mark the points $A(1, 0)$, $B(6, 0)$, $C(7, 4)$, $D(2, 4)$

- (b) Write the most suitable name for the quadrilateral $ABCD$.
- (c) What is the perpendicular distance from the vertex D to the side AB ?
- (d) Find the area of the quadrilateral $ABCD$.

34. In the picture, chords AB and CD of the circle are extended to meet at P . $\angle BAC = 70^\circ$



- (a) What is the measure of $\angle BDC$?
- (b) Check whether the angles of the triangles APC and BPD are the same or not.
- (c) Prove that $PA \times PB = PC \times PD$.
- (d) If $PA = PC$, what is the measure of $\angle DBP$?
- (e) Prove that if $PA = PC$, $ABDC$ is an isosceles trapezium.

35. In the figure, two circles intersect at P . CD is the common tangent of the circles.

Radius of the smaller circle is 4 centimetres and the radius of the larger circle is 9 centimetres. AE is perpendicular to BC

- (a) What is the measure of $\angle ADC$?
- (b) Prove that $AECD$ is a rectangle.
- (c) What are the lengths of AB and BE ?
- (d) What is the length of the tangent CD ?

