SAMPLE QUESTION PAPER-1

MATHEMATICS

THIRUVANANTHAPURAM EDUCATIONAL DISTRICT

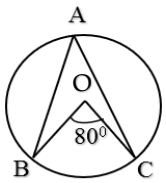
STANDARD X

Time: 2 ½ hours **Maximum Score: 80**

PART 1

A. Answer any four questions from 1 to 6. Each question carries 1 score. (4x1=4)

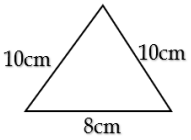
1) Algebraic form of an arithmetic sequence is 3n + 2. What is its first term?
2) In the figure, O is the centre of the circle. What is the measure of <BAC?



3) Natural numbers from 1 to 5 are written in paper slips and put in a box. If one slip is taken out from it without looking, then what is the probability of it being an even number?
4) Among the points (-4,0), (2,4), (0,6), which is the point on the X-axis?
5) A cone is made by rolling up a semicircle of radius 8cm. What is the base radius of the cone?
6) If (x-2) is a factor of the polynomial $P(x) = x^2 - 4$, what is the second factor?

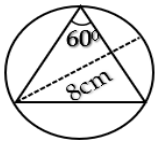
B. Answer all questions from 7 to 10. Each question carries 1 score. (4x1=4)

7) One lateral face of a square pyramid is given in the figure. What is the base area of this square pyramid?



(100 sq.cm, 64 sq.cm, 80 sq.cm, 32 sq.cm)

8) (3, a) is a point on the line x + y = 4. What is the value of a?
(5, 4, 3, 1)
9) In the figure, the diameter of the circle is 8cm. What is the length of the chord BC?



(8√3cm, 4√3cm, 4cm, 8cm)

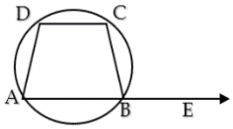
10) Perimeter of a triangle is 18cm and area is 27sq.cm. What is the radius of the incircle of this triangle?
(3cm, 6cm, 9cm, 7cm)

PART 2

A. Answer any three questions from 11 to 15. Each question carries 2 scores. (3x2=6)

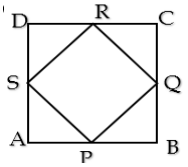
11) Write the arithmetic sequence with first term 7 and common difference 3. Find the 21st term of the sequence

12) In the figure ABCD is a cyclic quadrilateral. AB is extended to E. If <CBE= 100^0,



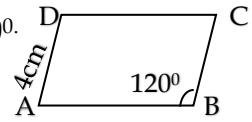
a) Find <CBA?
b) Find <CDA?

13) In the figure, PQRS is a square formed by joining the midpoints of the sides of the square ABCD.



a) In the square PQRS, if we join PR and QS, how many small right triangles will you get?
b) If a dot is put in the figure without looking, what is the probability that the dot is within the square PQRS?

14) In the figure, ABCD is a parallelogram. AD = 4cm, <B = 120^0.



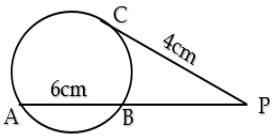
a) What is <A?
b) What is the perpendicular distance from D to AB?

15) Scores awarded to a student in five consecutive test papers is given below
42,38,37,44,39
Find the Mean and Median of the scores.

B. Answer any two questions from 16 to 18. Each question carries 2 scores each. (2x2=4)

16) Sum of first n terms of an arithmetic sequence is $3n^2+n$. Find the first term and common difference.

17) In the figure, the length of the chord AB is 6cm. The chord is extended to P and the tangents drawn from that point, have length 4cm. Find the length of BP.



18) The equation of a circle is $(x-2)^2+(y-3)^2=25$
a) Write the coordinates of the centre of the circle?
b) What is its radius?

PART 3

A. Answer any three questions from 19 to 23. Each question carries 4 scores. (3x4=12)

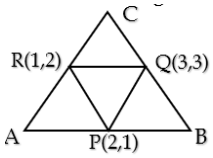
19) Draw a circle of radius 4cm. Draw a triangle with two of its angles 60^0 and 70^0 with all its vertices on the circle.

20) a)The perimeter of a rectangle is 40 cm. Length of its smaller side is 7cm. What is the length of its larger side?
b) Find the sides of a rectangle with perimeter 40cm and area 96 sq.cm.

21) Draw a circle of radius 3cm. Mark a point P outside the circle at a distance 7cm from the centre. Draw tangents from P to the circle. Measure of the length of the tangents.

22) A sector of central angle 216^0 is cut from a circular disc of radius 25cm. The sector is then rolled up to make a cone.
   a) What is the slant height of the cone?
   b) Find the base radius of the cone.
   c) Find the height of the cone.
   d) Find the volume of the cone.

23) In the figure, P, Q, R are the midpoints of the sides of the triangle ABC.

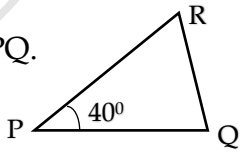


   a) What type of the quadrilateral is PQCR?
   b) Write the coordinates of vertices A, B, and C.

B. Answer any one question from 24 to 25. Each question carries 4 scores. (1x4=4)

24) A box contains 6 red beads and 5 white beads. Another box contains 8 red beads and 4 white beads. If one bead is taken from each box, then
   a) What is the number of possible pairs?
   b) What is the probability of both beads being red?
   c) What is the probability of one being white and other being red?
   d) What is the probability of getting at least one red bead?

25) In triangle PQR, PQ=14cm, PR=10cm, $<P=40^0$.
   a) Find the length of the perpendicular from R to PQ.
   b) Find the area of triangle PQR.
   ($\sin 40^0 = 0.64$, $\cos 40^0 = 0.76$)



PART 4

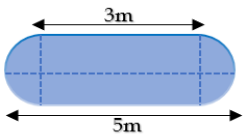
A. Answer any three questions from 26 to 29. Each question carries 6 scores. (3x6=18)

26) a) Draw a rectangle of area 12sq.cm.
   b) Draw a square having the same area of the rectangle.

27) A man standing at the edge of a river sees the top of a tree at an elevation of 60^0. Stepping 20 metres back he sees it at an elevation of 30^0. Draw a rough figure. Find the width of the river and height of the tree.

28) a) Draw the coordinates axes and mark the points O (0,0), A (4,0), B (7,6), C (3,6).
   b) Join these points in order to form a quadrilateral OABC. Write a suitable name for this quadrilateral.
   c) Find the area of the quadrilateral OABC.

29) A tank is in the shape of a cylinder with two hemispheres attached to both ends as shown in the figure.



The length of the cylinder is 3 metres and total length of the tank is 5metres.
   a) What is the radius of the hemisphere?
   b) Find the volume of cylindrical part and one hemispherical part.
   c) How many litres can the tank hold? ($1m^3$ = 1000 litre)

B. Answer any two questions from 30 to 32. Each question carries 6 scores. (2x6=12)

30) Consider the arithmetic sequence 7,11,15, …
   a) What is the algebraic form of this sequence?
   b) What is the sum of first n consecutive terms of the above sequence?
   c) How many terms of this sequence, starting from the first, are to be added to get 250?

31) a) If $P(x) = x^2 - 7x+13$. What is P (3)?
   b) Find P(x) - P (3).
   c) Write the polynomial P(x)-P (3) as the product of two first degree polynomials
   d) Find the solutions of the equation P(x) - P (3) = 0

32) The table below shows the number of children in a class, sorted according to their heights.

Height(cm)	Number of children
130 -140	7
140-150	9
150-160	10
160-170	10
170-180	9

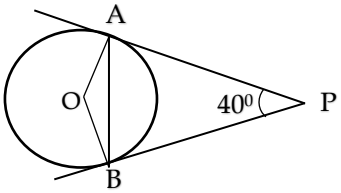
If the students are directed to stand in a line according to the order of their heights starting from the smallest, then
   a) The height of the child at what position is taken as the median?
   b) What is the assumed height of the child in the 17^{th} position?
   c) Find the median height.

PART 5

A. Answer any two questions from 33 to 35. Each question carries 8 scores. (2x8=16)

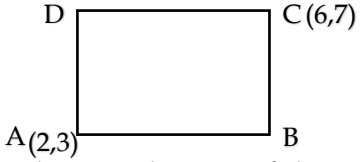
33) a) Write the sequence of three digit numbers which are multiples of 5. How many numbers are there in this sequence?
   b) Write the first three digit number which leaves a remainder 2 on division by 5. How many numbers are there in this sequence?
   c) Find the sum of all three digit numbers which leaves a remainder 3 on division by 5.

34) In the figure, PA and PB are tangents.



   a) What is the measure of <AOB?
   b) What are the measures of <PAB and <OBA?
   c) Draw a circle of radius of 2.5cm. Draw a triangle of angles 60^0, 70^0 with the sides touches the circle.

35) In the figure, ABCD is a rectangle with the sides parallel to the axes.



   a) Write the coordinates of the vertices of B and D.
   b) Calculate the area of the rectangle
   c) Find the length of the diagonal AC.
   d) If draw a circle with AC as the diameter, what are the coordinates of the centre?