



## MATHEMATICS

Time : 2 Hours 30 Minutes

Score : 80

### Questions 1 to 6 answer any 4 questions ( 4x1=4)

- 1 Write the next term of the sequence 13,22,31,.....
- 2 AB is the diameter of a circle and C is a point inside the circle . Which of the following is suitable for measure of  $\angle ACB$  ?  
(30,60,90,120)
- 3 If  $(x+3)^2=49$  then find the values of x?
- 4 Which of the following is a point on the X axis?  
[(0,1)(1,0)(1,-1)]
- 5 If  $\sin X = \cos X$  then the value of X is
- 6 If a dice is tossed then what is the probability to get it being a perfect square ?

### Questions 7 to 10 answer all questions

- 7 Base perimeter of a square pyramid is 16cm. What is the length of it's base edge?
- 8 The perimeter of a triangle is 16cm and it's area is  $16 \text{ cm}^2$  . What is the length of it's incircle radius?
- 9 Equation of a circle with centre as origin is  $x^2+y^2=1$ . Find the radius of the circle?
- 10 The algebraic form of sum of an arithmetic sequence is  $2n^2+n$ . Find it's common difference?

### Questions 11 to 15 answer any 3 questions (2x2=4)

- 11 Choose a number from 1 to 25, What is the probability to it being two digit number?
- 12 Angles of a triangle are  $45^\circ, 45^\circ, 90^\circ$ . It's largest side is 6cm . What is the perimeter of the triangle?
- 13 A cone is made by rolling up a sector of Central angle  $120^\circ$  and radius 12 cm . Find
  - a) slant height of the cone.
  - b) base radius of the cone.

- 14 A line passes through the points (1,2) and (2,4). Find the slope of the line. Check whether (3,5) be a point on the line.
- 15 Seventh term of an arithmetic sequence is 44 and common difference is 6. Write the sequence.

**Questions 16 to 18 answer any 2 questions (2x2=4)**

- 16 A box contains 6 black pearl, 9 white pearl and 5 red pearl. Another box contain 4 black pearl, 6 white pearl and 8 red pearl. If you take one pearl from each box without looking the box
- a) How many pairs are there in total?
- b) What is the probability that both being black?
- 17 A number added to its square gives 30. Find the number.
- 18 Check whether (4,1), (2,3) are points on the line  $4x-3y+1=0$

**Questions 19 to 23 answer any 3 questions (3x4=12)**

- 19 The algebraic form of an Arithmetic sequence is  $7n + 3$
- a) Find the common difference.
- b) What is the remainder when each term of the sequence is divided by common difference?
- c) Find fifteenth term of the sequence.
- d) Which is the smallest three digit number in this sequence?
- 20 A rectangular box has 20cm long, 12cm wide and 15cm height.
- a) What is the diameter of The largest sphere that can be placed in the box?
- b) What is the volume of the sphere?
- c) If the sphere is divided into 2 hemisphere then what is the total surface area of a hemisphere?
- 21 Draw a circle of radius 3.5cm with centre 'O'. Mark the point P which is 7 cm away from the centre O. Draw the tangents PQ, PR from the point P to the circle. Measure the length of tangents. Find  $\angle ORP$ .
- 22 In triangle ABC  $AB=8\text{cm}$ ,  $BC=12\text{cm}$ ,  $\angle B=60^\circ$ .
- a) What is the perpendicular distance from A to BC?
- b) Find the area of triangle ABC.
- 23 The length of a rectangle is 6cm more than its breadth. The length of diagonal is 30 cm.
- a) If breadth is x then what is length?

b) Find the length and breadth of the rectangle .

**Answer any 1 question 24 to 25 (1x4=4)**

24 The line  $2x+3y-12=0$  crosses the X axis at A and Y axis at B

a) Find the coordinates of A and B .

b) C is the midpoint of AB. Find the coordinates of C .

c) Find the equation of the line which passes through the origin and the point C .

25 There is a tent in the shape of a square pyramid with base perimeter 80 cm and lateral edge is 26cm.

a) What is the length of base edge ?

b) What is the slant height of the tent?

c) For covering the lateral part of the tent, how many square meter of tarpaulin is needed?

**Questions 26 to 29 answer any 3 questions (3x6=18)**

26 (a) Without drawing an angle bisector , construct an angle of measure  $32.5^\circ$  .

(b) Draw a triangle of circum radius 4cm and angles are  $40^\circ, 65^\circ, 75^\circ$ .

Measure the length of it's smallest side.

27 (a) Draw a line of length  $\sqrt{12}$  cm

(b) Draw a rectangle of length 6.5cm and breadth 3cm . Draw a square of same area.

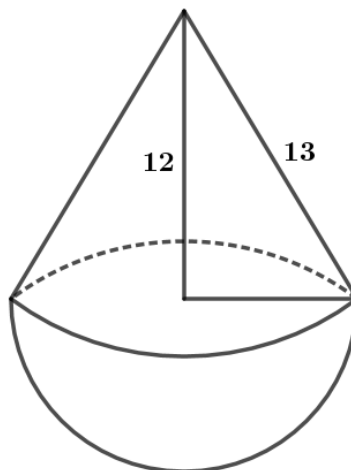
28 A boy stands between two buildings of the same height. The buildings and the child stand on the same line. From there he sees the top of buildings at an angle of elevation of  $45^\circ$  and  $30^\circ$ . The nearest building is 20m away from he stands.

(a) Draw a rough figure.

(b) Find the heights of buildings

(c) Calculate the distance between the buildings.

29



A cone of the same radius fixed on the plane face of a hemisphere, as shown in the figure. The height of the cone is 12 cm and slant height is 13cm.

- (a) What is the radius of the cone?
- (b) What is the curved surface area of the hemisphere?
- (c) Calculate the total surface area of this solid?

**Questions 30 to 32 answer any 2 questions(2x6=12)**

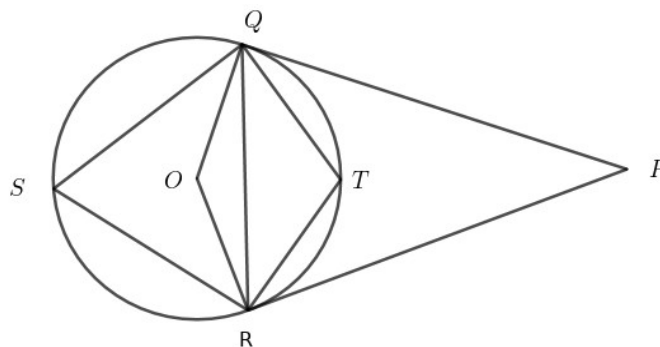
- 30 Draw a triangle of sides 5cm, 6cm, 7cm . Draw it's incircle. Measure it's radius .
- 31 A man sees the top of a tree on the bank of a river at an angle of elevation of  $70^\circ$  from the other bank. Stepping 20 metres back, he sees the top of the tree at an angle of elevation of  $55^\circ$ . Height of the man is 1.4 metres.
- (a) Draw a rough figure and mark the measurements
  - (b) Find the height of the tree
  - (c) Find the width of the river. [tan  $70^\circ=2.75$ , tan  $55^\circ=1.43$ ]
- 32 Draw a circle of radius 2.5cm. Draw a triangle of two angles  $55^\circ, 80^\circ$  with all it's sides touching the circle. Measure the length of all sides.

**Questions 33 to 35 answer any 2 questions(2x8=16)**

- 33 Babu wrote an arithmetic sequence. It's first term is 7 and fourth term is 19.
- a) Find common difference of this sequence. Find 15th term
  - b) Write the algebraic expression of this sequence . Is 425 be a term of this sequence?
  - c) What is the sum of the first 20 terms of this sequence?
  - d) Babu claims that no perfect squares is a term of this sequence. Is it true? Why?
- 34 A(5,-3), B(-1,5), C(7,11) are the vertices of triangle ABC.
- a) What is the length of AB, BC and AC?
  - b) Prove that triangle ABC is a right triangle?
  - c) M is the midpoint of AB, if N is the midpoint of BC . Find coordinates of M, N .
  - d) Find slope of line AC . Find slope of line MN .

Is there any relation between these? Explain.

35



In the figure O is the centre of the circle. PQ, PR are the tangents drawn from P. S, T are the points on the circle.

If  $\angle OQR = 35^\circ$

a) Find  $\angle ORQ$

b) Find  $\angle QOR$

c) Find  $\angle QSR$

d) Find  $\angle QTR$

e) Find  $\angle PQR$

f) Find  $\angle ORP$

g) Find  $\angle QRP$

h) Find  $\angle QPR$