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BENGALURU REGION
I - PRE- BOARD 2018-19

SUBJECT : MATHEMATICS
CLASS : X

Max .Marks : 80
Time : 3 Hrs

General Instructions:

1. All the questions are compulsory.
2. The questions paper consists of 30 questions divided into 4 sections A, B, C and D.
3. Section A comprises of 6 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 10 questions of 3 marks each. Section D comprises of 8 questions of 4 marks each.
4. There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, four questions of 3 marks each and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
5. Use of calculators is not permitted.

PART A

- 1 Write the value of the K for which the quadratic equation $Km(m-2) + 6 = 0$ has equal roots. 1
- 2 Write the quadratic polynomial whose zeros are $3 + \sqrt{2}$ and $3 - \sqrt{2}$ 1
- 3 Explain why: $7 \times 11 \times 13 + 13$ is a composite number. 1

(OR)

Write the LCM of p and q if p and q are co primes.

- 4 Let $\Delta ABC \sim \Delta DEF$. If $ar(ABC) = 100 \text{ cm}^2$ and $ar(DEF) = 196 \text{ cm}^2$ and $DE = 7 \text{ cm}$ then find AB. 1
- 5 If the numbers $x - 2$, $4x - 1$, and $5x + 2$ are in AP, Find the value of x. 1
- 6 Express the trigonometric ratios $\sin A$ and $\sec A$ in terms of $\cot A$ 1

(OR)

If $\tan A = \cot B$ then Find the measure of $A+B$.



PART B

- 7 Prove that the tangents drawn at the ends of a diameter of a circle are parallel to each other. 2
- 8 Find the quadratic polynomial if the sum and product of its zeroes are respectively $-\frac{1}{4}$, $\frac{1}{4}$. 2
- 9 Find the coordinates of the point on y-axis which is nearest to the point $(-2, 5)$. 2
- 10 Find the value of $x + \frac{1}{x}$ if $x^2 - 2x + 1 = 0$ 2

(OR)

Find two numbers whose sum is 27 and product is 182.

- 11 Find the 9th term from the end of the AP 5, 9, 13, -----, 185. 2

(OR)

How many terms of the AP . 18, 16, 14 be taken so that their sum is zero ?

- 12 If tangents PS and PT from a point P to a circle with centre O are inclined to each other at an angle of 80° then What is the measure of an angle POT. 2

PART C

- 13 The traffic lights at three different road crossings changes after every 48 seconds, 72 seconds and 108 seconds respectively. if they change simultaneously at 8 a. m , at what time will they change together again? 3

(OR)

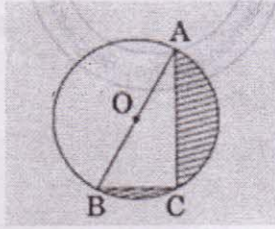
Use Euclids division lemma to show that square of any positive integer is either of the form $3m$ or $3m + 1$. For some integer m .

- 14 Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60° 3
- 15 Solve the following pair of equations graphically and shade the region 3

between the two lines represented by the equations and the X -axis.

$$2x + 3y = 12 \text{ and } x - y - 1 = 0$$

16



O is the centre of the circle such that diameter $AB = 10$
and $AC = 8$ cm . find the area of the shaded region.

3

(OR)

- 17 Find the area of a quadrant of a circle whose circumference is 22 cm. The radii of two circles are 19 cm and 9 cm respectively. Find the radius of the circle which has circumference equal to the sum of the circumferences of the two given circles.

- 18 D , E and F are the mid points of sides AB, BC and CA respectively of a triangle ABC. Find the ratio of areas of $\triangle DEF$ and $\triangle ABC$.

- 19 The shadow of a tower standing on the level ground is found to be 40 m longer when the sun's altitude is 30° than when it is 60° . Find the height of the tower.

- 20 Find a relation between x and y such that the point $P(x,y)$ is equidistant from (7,1) and (3,5) (OR)

Find the coordinates of the points of trisection of line segment joining (4,-1) and (-2,-3)

- 21 Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of m for which $y = mx + 3$.

- 22 Prove that $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$

(OR)

If $\tan (A+B) = \sqrt{3}$ and $\tan (A-B) = \frac{1}{\sqrt{3}}$, $0 < A+B \leq 90^\circ$, $A > B$,

PART D



- 23 Draw a triangle ABC with side BC = 6 cm , AB = 5 cm and $\angle C = 60^\circ$. then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC. 4

(OR)

Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then another triangle whose sides are $1\frac{1}{2}$ times the corresponding sides of the isosceles triangle.

- 24 Find all the zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$. if you know that two of its zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$. 4

- 25 Prove that If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points , the other two sides are divided in the same ratio. 4

(OR)

Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonals

- 26 A man on the top of a vertical observation tower observes a car moving at a uniform speed coming directly towards it. If it takes 12 minutes for the angle of depression to change from 30° to 45° , how long will the car take to reach the observation tower from this point? 4

(OR)

The angle of elevation of a cloud from a point 60 m above the surface

