Sample Paper 5

Section A

1. Choose the correct option:

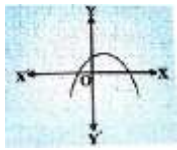
i) The product of a nonzero rational and irrational number is always an…….

$a)$ Rational $b)$ Irrational $c)$ Integer $d)$ Natural

ii) If α and β are zeroes of a quadratic polynomial then polynomial $p(x) = x^2 - (\ldots\ldots)x + (\ldots\ldots)$

$a)$ $\alpha+\beta, \alpha\beta$ $b)$ α, β $c)$ $\alpha\beta, \alpha+\beta$ $d)$ $\alpha-\beta, \alpha\beta$

iii) Find the number of zeroes of $y = p(x)$ in fig



$a)$ 1 $b)$ 0 $c)$ 2 $d)$ 3

iv) The solution of $x + y = 8, x - y = 2$

$a)$ 5, 3 $b)$ 6, 4 $c)$ 7, 5 $d)$ 6,2

v) If the roots of a quadratic equation are equal then

$a)$ $D > 0$ $b)$ $D \geq 0$ $c)$ $D < 0$ $d)$ $D = 0$

vi) In an AP, $a_n - a_{n-1} =$

$a)$ 0 $b)$ a $c)$ d $d)$ 1

vii) The ratio of corresponding sides of two similar triangles are in 4:5 then find the ration of their corresponding medians.

$a)$ 5:4 $b)$ 16:25 $c)$ 25:16 $d)$ 4:5

viii) $\frac{1-tan^2 45°}{1+tan^2 45°} =$

$a)$ $tan90°$ $b)$ $tan45°$ $c)$ $sin45°$ $d)$ $tan0°$

ix) $sin^2\theta + cos^2\theta =$

$a)$ 0 $b)$ 1 $c)$ 2 $d)$ $\sqrt{2}$

x) TP and TQ are two tangents of a circle with center O and $\angle POQ = 110°$ Then $\angle PTQ =$

$a)$ 60° $b)$ 70° $c)$ 80° $d)$ 90°

xi) If a circle is divided in 10 equal parts then central agle of each part is =

$a)$ $60°$ $b)$ $45°$ $c)$ $36°$ $d)$ $24°$

xii) If the volume of a sphere is equal to its surface area then radius of sphere =

$a)$ 2 $b)$ 4 $c)$ 6 $d)$ 3

xiii) Find the lateral surface area of a cylinder with 3 cm radius and 7 cm height.

$a)$ 21π cm^2 $b)$ 42π cm^2 $c)$ 28 cm^2 $d)$ 24 cm^2

xiv) In a series, mean is 12 and median is 10 then find the mode.

$a)$ 15 $b)$ 30 $c)$ 6 $d)$ 28

xv) Which of the following can not be probability of an event?

$a)$ 80% $b)$ $\frac{3}{2}$ $c)$ 0.05 $d)$ $\frac{1}{3}$

xvi) The probability of getting a prime number in a single throw of dice :

$a)$ $\frac{2}{3}$ $b)$ $\frac{1}{3}$ $c)$ $\frac{1}{2}$ $d)$ $\frac{1}{4}$

2. Choose True/False:

i) Smallest prime number is 1.

ii) If the linear equations has $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ then it has no solution.

iii) The equation $x^2 - 9 = 0$ has real roots.

iv) If point B is midpoint of AC then $AB: AC = 1:2$

v) For all values of θ, $sin\theta = cos\theta$

vi) There is only one tangent at a point on a circle.

vii) The mean of first n natural numbers is $\frac{n+1}{2}$.

3. Fill in the blanks:

i) The solution of $5x + 3y = 6, 10x + 6y = 6$.....

ii) The common difference of AP if general term is $4 - 3n$.....

iii) In ΔABC, $PQ||BC$ then $\frac{AP}{PB} = \frac{AQ}{....}$

iv) The distance of point $(-3,4)$ from origin is.....

v) The region enclosed between radii and arc of a circle is .....

vi) The total surface area of hemisphere is.....

vii) If $P(E) = 0.012$ then $P(E \text{ not})$ = ...

Section B

4. If HCF(306,657) = 9 then find LCM(306,657).

5. Form a quadratic polynomial whose sum of zeroes is $\frac{-1}{2}$ and product is $\frac{-2}{3}$.

6. AN umbrella has 8 wires which are at equal distance. If umbrella is considered as a flat circle of radius 45cm then find the area between two wires.

7. In a class, there are 40 students in which 25 are girls. One student is selected to be a monitor, find the probability that monitor is a boy.

Section C

8. For what value of k, the equation $2x^2 + kx + 3 = 0$ has equal roots.

9. Find the sum of first 22 terms of AP whose $d = 7$ and 22^{nd} term is 149.

10. In what ratio does the point $(-1,6)$ divides the line segment joining $(-3,10)$ and $(6,-8)$? **OR**
Check whether the points $A(3,1), B(6,4), C(8,6)$ are collinear.

11. Prove that $(\text{cosec}\theta - \cot\theta)^2 = \frac{1-\cos\theta}{1+\cos\theta}$ **OR**
If $\tan(A+B) = \sqrt{3}$ and $\tan(A-B) = \frac{1}{\sqrt{3}}$ then find A and B.

12. From a point which is 30 m away from the base of a tower, the angle of elevation of the top of tower is 30^0. Find i) height of tower ii) Distance of a point from the top of tower.

13. A solid is made by scooping out hemispheres from both ends of a wooden solid cylinder. If height of cylinder is 10cm and radius of base is 3.5cm then find the total surface area of the solid.

Section D

14. Check whether the equations $4x - 3y = 6, 5x + 4y = 23$ have a unique solution, if yes then solve. **OR**

If 2 is added to numerator and denominator of a fraction, it becomes $\frac{9}{11}$. If 3 is added to both then it becomes $\frac{5}{6}$. Find the fraction.

15. State and Prove Thales Theorem **OR**

Prove that the tangent at a point on the circle is perpendicular to the radius through point of contact.

16. Find x and y if the median of 60 terms is 28.5

CI	0-10	10-20	20-30	30-40	40-50	50-60
F	5	x	20	15	y	5

OR

Find the mode of the following

CI	0-20	20-40	40-60	60-80	80-100	100-120	120-140
F	19	8	12	15	10	10	6