

**SAMPLE PAPER**

**MATHEMATICS**

**STANDARD – X**

**MARKS: 100  
Time: 3 Hrs.**

**Section- A (10 x 3 = 30)**

1. Solve :  $\frac{15}{u} + \frac{2}{v} = 17$  :  $\frac{1}{u} + \frac{1}{v} = \frac{36}{5}$  \_\_\_\_\_

2. Find the values of a and b, if the HCF of the polynomials

$f(x) = (x + 3)(2x^2 - 3x + a)$  and

$g(x) = (x-2)(3x^2 + 10x - b)$  is  $x^2 + x - 6$ .

Or

The HCF & LCM of two polynomials

$p(x)$  and  $q(x)$  are  $5(x^2 + 2x - 3)$  and  $20x(x^2 - 9)(x^2 - 3x + 2)$  respectively. If  $p(x) = 10(x^2 - 9)(x - 1)$ . Find  $q(x)$ .

3. Reduce the following rational number to its lowest terms

$\frac{x^4 + x^2 + 1}{-x^2 + x + 1}$  \_\_\_\_\_

Or

Simplify:

$\left( \frac{x}{1+x} - \frac{1}{1-x} \right) \div \left( \frac{x}{1+x} - \frac{1}{1-x^2} \right)$  \_\_\_\_\_

4. Find the sum of the first 24 terms of the square whose  $n^{th}$  term is given by  $a_n = 3 + 2n$

3

or

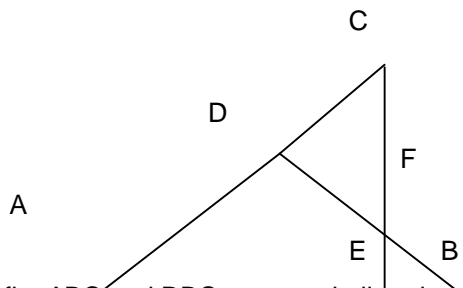
$a_{10} - a_5 = 200$ , find the common difference.

5. Find the A.P. whose 11<sup>th</sup> term is 5 and 18<sup>th</sup> term is 79.

6. An article is sold for Rs. 500 cash or for Rs. 150 cash down payment followed by 5 equal monthly installments. If the rate of interest charged is 18% p.a. compute the monthly installment.

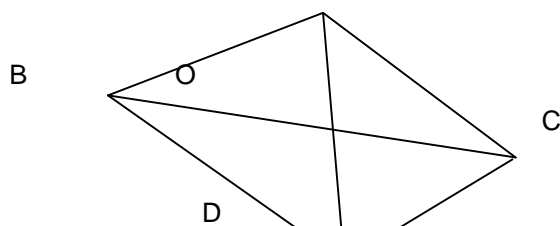
7. A car is available for Rs.402200 cash or for Rs.150000 cash down payment and 3 equal half yearly installments. If the interest is charged at 10% per annum compounded half yearly, find the value of each installment.

8. In fig.  $BD \perp AC$  and  $CE \perp AB$ , Prove that  $AC \times BD = AB \times CE$



9. In fig. ABC and DBC are two similar triangles on the same base Prove that

$\frac{\text{ar}(\Delta ABC)}{\text{ar}(\Delta DBC)} = \frac{AO}{DO}$  \_\_\_\_\_



10. AB is a diameter and AC is a chord of a circle such that  $\angle BAC = 30^\circ$ . The tangent at C intersects AB produced in a point D. Prove that  $BC = BD$

Section – B ( 10 x 4 = 40 )

11. Solve Graphically:

$$2x - 3y = 5; \quad 3x + 4y + 1 = 0$$

12. A motor boat whose speed is 9 km / hr in still water, goes 12 km, down stream and comes back in a total time of 3 hours. Find the speed of the stream .

Or

$$\text{Solve: } 3y^2 + (6 + 4a)y + 8a = 0$$

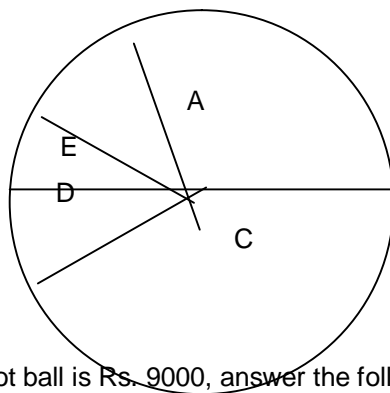
13. If  $\sin 3\theta = \cos (\theta - 6^\circ)$ , find the value of  $\theta$  .
14. 50 circular plates, each of radius 7 cm and thickness  $\frac{1}{2}$  cm are placed one above another to form a solid right circular cylinder. Find the total surface and the volume of the cylinder so formed.
15. Construct a cyclic quadrilateral ABCD where  $AB = 3$  Cm,  $BC = 6$  cm  $CA = 4$  cm and  $AD = 2$  cm. Also , construct a quadrilateral similar to ABCD whose sides are 1.5 times the corresponding sides of ABCD.

16. Find the mean ( By Step deviation method)

C I	11-13	13-15	15-17	17-19	19-21	21-23	23-25
f	3	6	9	13	8	5	4

17. Cards marked with the numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from this box. Find the probability of  
(i) an even number (ii) a number which is a perfect cube.

- 18.



**A – 45° - Foot Ball**

**B – 100° - Hockey**

**C - 160° - Cricket**

**D – ? - Basket Ball**

**E - 35° - Tennis**

If the money spent on Foot ball is Rs. 9000, answer the following questi

- (i) What is the total amount spent on sports?  
(ii) What is the amount spent on Basket Ball?

19. Find the ratio in which the line points ( 6,4 ) and ( 1, - 7 ) is divided internally by the axis of x .

20. Derive the distance formula ( or) Section formula.

**SECTION – C ( 5 x 6 = 30)**

21. If a line is drawn parallel to one side of a triangle, prove that the other two sides are divided in the same ratio. Using the above result, prove that the diagonals of a trapezium divide each other in the same ratio.
22. If a line touches a circle and from the point of contact a chord is drawn, the angles which this chord makes with the given line are equal respectively to the angles formed in the

corresponding alternate segments. Prove. Use this result to prove that the tangent at A to the circum circle of an isosceles  $\Delta ABC$ , in which  $AB = AC$  is parallel to BC .

23. A vertical tower is surrounded by a flag staff of height ' h 'metres. At a point on the ground, the angles of elevation of the bottom and top of the flagstaff are  $\alpha$  and  $\beta$  respectively. Prove that the height of the tower is

$$\frac{h \tan \alpha}{\tan \beta - \tan \alpha}$$

24. A solid toy is in the form of a hemisphere surmounted by a right circular cone. If the height of the cone is 4 cm and the diameter of the base is 6 cm. Calculate the volume of the toy and surface area of the toy.

25. Raja's total annual salary excluding HRA is Rs. 1,20,500. He contributes Rs. 200 per month in his G.P.F. and Rs.10,800 towards L.I.C annual premium.

Assume the following for calculating income tax:

- a) Standard deduction 1/3 of the total income subject to maximum of Rs. 25000 in case the total annual income is more than Rs.1,50,000.

- b) Rate of income tax

Slab	Income tax
i) Up to Rs. 50,000	No tax
ii) From Rs 50,001 to Rs. 60,000	10% of the amount exceeding Rs.50,000
iii) From Rs. 60,001 to Rs. 1,50,000	Rs.1000 + 20% of the amount exceeding Rs. 60,000.
iv) Above Rs. 1,50,000	Rs.19,000 + 30 % of the amount exceeding Rs.1,50,000.
c) Rebate in income tax	i) 20 % of the amount of saving subject to maximum Rs.14,000/- if taxable income is up to Rs. 1,50,000. ii) 15% of the amount of saving subject to a maximum of Rs. 10,500/- if taxable income is above Rs. 1,50,000.
d) Surcharge	5% of the net income tax paid.

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