CLASS X
SAMPLE PAPER
MATHS

Max.Marks: 80

Section B has 6 questions of 2 marks each, Section C has 10 questions of 3 marks each and Section D has 8 questions of 4 marks each.

All questions are compulsory.

There is no overall choice. However, internal choices are given in 4 questions of 3 marks and 3 questions of 4 marks. Answer any one of the alternatives in such cases.

Section-A

1.For what value of 'm' the HCF of 45 nd 63 can be expressed as 45m-63x2?

2. Fourth term of an A.P. is 51. The difference between 20^{th} and 12^{th} terms is -32. Find the A.P.

3. Find 'p' if the equation $2px^2 + 6x + 5 = 0$ has equal roots.

4. Diagonals of a trapezium intersct at 'O'. If $\frac{OA}{OC} = \frac{OB}{OD} = \frac{1}{2}$ and AB = 3.5 cm find DC.

5. Three consecutive vertices of a parallelogram are (3,-4), (-1,-3), and (-6,2) find the fourth vertex.

6. If $3\tan\theta = 4$, find $\frac{3sin\theta+2cos\theta}{3sin\theta-2cos\theta}$.

Section-B

7. Find the smallest 4-digit number divisible by 15,25 and 30.

8. Points P(a,-4), Q(-2,b) and R(0,2) are collinear. Q lies between P and R such that PR = 2QR. Find 'a' and 'b'.

9. Determine 'k' such that $k^2 + 4k + 8$, $k^2 + 3k + 6$ and $3k^2 + 4k + 4$ are in A.P.

10. For what values of 'k' the system of equations *x+(k+1)y=5 ;(k+1)x +9y = 8k- 1*,will have infinitely many solutions.

11. 50 cards are numbered 1-50. One card is drawn at random. Find the probability that the drawn card bears (i) a perfect square. (ii) A number divisible by both 2 and 6.

12. All kings from a pack of cards are removed. One card is drawn at random. What is the probability that the drawn card is (i) a face card (ii) A card of hearts suit.

Section-C

13. Prove that square of every positive integer is of the form 3m or 3m+1 for some integer 'm'.

14. Five times a two digit number is equal to six times the number obtained by reversing the digits. If the digits differ by 1, find the number.

15. If α, β are zeroes of the polynomial $3x^2 + 11x - 4$, find the value of $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$

16. Points A(4,-2), B(7,2), C(0,9) and D(-3,5) form a parallelogram. Find the length of the altitude on AB.

17. ABCD is a trapezium with AB‖ DC. Diagonals AC and BD intersect at E. ΔAED is similar to ΔBEC. Prove that AD = BC.

OR

In a ΔABC, AD⊥ BC such that DB = 3CD. Prove that $2AB^2 = 2AC^2 + BC^2$

18. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre. **OR**

Construct a ΔABC in which AB =4.5 cm, BC = 3.6 cm and ∠B = 75^o and construct a similar triangle A'BC' with scale factor 3/5.

19. Mean of the following data is 28. Find the missing frequency.

Class Int	0-10	10-20	20-30	30-40	40-50	50-60
Freq	12	18	27	p	17	6

20. If tanθ = $\frac{2}{\sqrt{7}}$, evaluate $\frac{cosec^2\theta - sec^2\theta}{cosec^2\theta + sec^2\theta}$

OR

If $a\ sin^3\vartheta + b\ cos^3\vartheta = sin\vartheta cos\vartheta$ *and* $a\ sin\vartheta = bcos\vartheta$, prove that $a^2 + b^2 = 1$.

21. ABC is a right triangle right angled at A. with BC = 10 cm and AB = 6cm. An incircle is inscribed in the triangle. Find area of the circle and the remaining part of the triangle.

22. A bucket is in the form of a frustum of a cone whose top and bottom radii are 28 cm and 21 cm respectively. It is 24 cm high and has a cylindrical base that is 6 cm high. Find the area of the metal used to make the bucket.

Section-D

23. A particular length of cloth costs Rs.300. had the cloth been 2mlongr and the rate Rs.5 lesser, the cost would have remained same. Find the length of the cloth and rate per metre.

OR

A good Samaritan donated RS.4800 to be distributed equally among the children of an orphanage. Had there been 8 children less each would have got Rs.20 more.Find the number of the children in the orphanage. What is the value exhibited by the donor?

24. A motorcycle costs Rs.1,60,000. Raju pays Rs.40,000 as advance and agrees to pay the rest in 8 equal installments. If interest at 4% is charged on the outstanding balance howmuch did Raju pay for the motorcycle?

25. State and prove the converse of Pythagoras theorem. In a ΔABC,∟A = 90^o AD ⍰ BC, prove that $AD^2 = BD.CD$ **OR**

Prove that areas of two similar triangles are proportional to the squares of corresponding sides.

Areas of two similar triangles are $144cm^2$ and $81cm^2$ respectively. If one side of the larger triangle is 16 cm find the length of the corresponding side of the smaller triangle.

26. An incircle of a triangle whose radius is 3 cm divides one of the sides of the triangle into two parts of 6cm and 3 cm, find the lengths of other two sides of the triangle.

27.If secθ + tanθ = *x*, prove that sinθ = $\frac{x^2-1}{x^2+1}$

28. A plane flying at height of 3125m passes vertically below another plane at an instant when the angles of elevation of the two planes from a point on the ground are observed to be 60^o and 45^o respectively. Find the distance between the planes.

29. The median of the following data is 36.Find the missing frequency.

Class Int	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Freq	4	5	x	20	14	8	4

OR

Draw a less than type Ogive for the given data and find the median from the graph.

Class Int	11-13	13-15	15-17	17-19	19-21	21-23	23-25
Freq	3	6	9	13	8	5	4

30.A cubical building of edge 12 m has hemispherical dome. Find the cost of painting its outer surface given that it has a door 3 x2 m and six windows 1.5x 2 m at Rs.9.50/m^2