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. If $T_n = 3n - 2$, Common difference is ____

a) 3 b) -2 c) 5 d) None of these

2. If $p = a^3b^4$ and $q = a^2b^3$- a and b being prime numbers H.C.F(p,q) is _____

a) ab b) a^3b^4 c) a^2b^3 d) a^3b^3

3. Radius of a sphere is doubled. Then its volume_____

a) becomes 8 times the original b) becomes half of original c) Remains unchanged

d) none of these

4. Ten cards are numbered 1 – 10. Probability of drawing a card having a multiple of 3 on it is __

a) 0.5 b) 0.7 c) 0.3 d) 0.6

5. A line that intersects a circle at two distinct points is a _____

a) chord b) secant c) tangent d) none of these

6. Co-ordinates of midpoint of the line joining points (6,-3) and (2,5) are ___

a) (1,1) b) (4,4) c) (4,2) d) none of these

Section-B

7. Find the smallest number that leaves remainders 9 and 18 when divided by 36 and 45 respectively.

8.Find the value of '*y*' if the distance between the points (6,1) and (2,*y*) is 10 units.

9. AOC is an isosceles right triangle right angled at 'O'. Using OA as radius a quadrant is drawn and using AC as diameter a semicircle is drawn. Find the area enclosed between two arcs if OA = 7 cm.

10. Draw a line segment AB = 7 cm and divide in in the ratio 5 : 3. Measure each part.

11. Find the area of minor segment of a circle of diameter 7 cm and central angle 45^{o}.

12. Prove:- $\frac{\tan A - \sin A}{sin^2 A} = \frac{\tan A}{1+cosA}$

Section-C

13. Show that cube of a positive intger is of the form 3m or 3m + 1 for some integer 'm'.

14. Which term of the A.P 64,60,56,… is the first negative term?

OR

A factory produces 700 units in the first year, 750 in the second and 800 in the third year and so on. How many unit will be produced in the ninth year and how many units are produced in six years?

15. Show that the points A(1,-3), B(-3,0) and C(4,1) are vertices of a right isosceles triangle.

OR

Determine the ratio in which the line *3x+y-9 = 0* divides the line joining points (1,3) and (2,7)

16. A circle is inscribed in a quadrilateral ABCD touching its sides. Show that the sum of its opposite sides are equal.

OR

Prove that tangents drawn to circle from an exterior point are (i) equal in length, (ii)inclined at the same angle to the line joining the point with the centre of the circle.

17. Prove that intercept tangent of two parallel tangents subtends a right angle at the centre of the circle.

18. Mean of the following data is 1080. Find the missing frequency.

Class Interval	800-900	900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500
Freq	10	15	8	12	x	5	3

19. A park is in the form of a square of side 80 m. There are four cicular flower beds at each corner and a circular flower bed in the centre of the park. If the radius of each of circular beds is 7 m find the remaining area of the park.

OR

A field is in the form of a trapezium. At each corner a horse is tied with a rope of length 14 m. Find the area grazed by the horses.

20. Twenty cards are numbered 1 -20. One card is drawn at random. What is the probability that the drawn card bears (i) a multiple of 5? (ii) an odd multiple of 3? (iii) an odd multiple of 4?

21. A flag staff of height 'p' m is atop a building. The angles of elevation of top and bottom of the flag staff from a point on the ground are A and B respectively. Show that the height of the building is given by $\frac{p \tan B}{\tan A - \tan B}$

22. Prove that : $\frac{2}{cos^2 A} - \frac{1}{sin^2 A} + \frac{1}{sin^4 A}$ = $\cot^4 A - \sin^4 A$

Section-D

23. Raju travels 500 km to his home partly by train and partly by car. If he had travelled 200 km by train and rest by car he would have reached his home in 5 ¾ hours. But had he travelled 200 km by car and rest by train he would have reached 15 minutes earlier. Find the speeds of car and train.

OR

A pale left 30 minutes late due to inclement weather. In order to reach its destination 3000 km away on time the speed of the plane was increased by 200 km/h. Find the usual speed of the plane.

24. Solve for '*x*' and '*y*': $\frac{10}{x+y} + \frac{2}{x-y} = 4$; $\frac{15}{x+y} - \frac{5}{x-y} = -2$

25. Find the sum of all 3-digit numbers that are not divisible by 7.

26. A circle is inscribed in a triangle. The radius of the circle which is perpendicular to one of the sides is 3 cm and divides the side into two parts of 9 cm and 4 cm find the length of the other two sides of the triangle.

27. If the equation $(1 + m^2)x^2 + 2mcx + c^2 - a^2 = 0$ has equal roots prove that $c^2 = a^2(1+m^2)$

OR

Determine the values of *'a' and 'b'I for* which the system of equations *3x- (a+1)y = 2b – 1 and*

5x +(1-2a)y = 3b has infinitely many solutions.

28. Height of a cone is 40 cm. A small cone is cut off at the top by a plane parallel to the base. If the volume of the small cone is 1/64 volume of the given one at what height the section is made?

29. A man standing on the deck of a boat 30 m above the lake observes angle elevation of a cloud to be 30^o and the angle of depression of its reflection in the water to be 60^o. Find the height of the cloud. (√3= 1.732)

OR

Two poles of equal height stand on the opposite edges of a street 80 m wide. From a point on the road- between the poles- the angles of elevation of the tops of the poles were observed to be 60^o and 30^o respectively. Find the heights of the poles and the position of the point.

30. A LIC agent has the following data for 100 policy holders in a locality. Find the median of the data.

Age (in years)	No. of policy holders
Below 20	2
Below 25	6
Below 30	24
Below 35	45
Below 40	78
Below 45	89
Below 50	92
Below 55	98
Below 60	100

Minimum and maximum age for giving a policy 18 years and 60 years respectively.