

# CLASS X SAMPLE PAPER MATHEMATICS

Max. Marks: 80

*Note: (i) This question paper consists of 40 questions divided into 4 sections A,B,C &D.*

*(ii) Questions in Section A carry 1 mark each, Section B carry 2 marks each, Section C carry 3 marks each and Section D carry 4 marks each.*

*(iii) There is no overall choice. However, internal choices are provided in 2 questions of Section A, 2 questions of Section B, 3 questions of Section C and 3 questions of Section D.*

*(iv) Use of calculators prohibited.*

## Section-A

1. 15 years hence a man will be 4 times as old as he was 15 years ago. His present age is-  
 a) 25 years                      b) 20 years                      c) 15 years                      d) 10 years
2.  $a, b$  and  $c$  are positive integers such that ' $a$ ' is a factor of ' $b$ '; and ' $c$ ' is a multiple of ' $b$ '. Then L.C.M( $a,b,c$ ) is \_\_\_\_  
 a)  $b$                                   b)  $a$                                   c)  $abc$                                   d)  $c$
3. Smallest number that leaves remainder 12 and 8 when divided by 32 and 28 is—  
 a) 204                                  b)224                                  c) 216                                  d) 194
4. The mid-point of the line joining points (3,- 2) and (- 5, - 2) lies in ----quadrant.  
 a) First                                  b) Second                                  c) Third                                  d) Fourth
5. Perimeter of the triangle formed by the points (0,0), (1,0) and (0,1) is \_\_\_\_  
 a)  $1 + \sqrt{2}$  units                      b)  $\sqrt{2} + 1$  units                      c) 2 units                                  d)  $2 + \sqrt{2}$  units
6. If ' $x$ ' is a positive integer such that the distance between the points (x, 2) and (3, -6) is 10 units then  $x =$  \_\_\_\_  
 a) 3                                  b) - 3                                  c) 9                                  d) - 9
7. Given  $\tan A = \frac{6}{5}$ , then value of  $\frac{5 \sin A - 3 \cos A}{4 \cos A + 5 \sin A}$  is \_\_\_\_  
 a)  $\frac{3}{5}$                                   b)  $\frac{3}{10}$                                   c)  $\frac{3}{4}$                                   d)  $\frac{1}{2}$
8.  $\frac{1 + \tan^2 A}{1 + \cot^2 A} =$  \_\_\_\_

- a)  $\sec^2 A$     b)  $-1$     c)  $\cot^2 A$     d)  $\tan^2 A$
9.  $8 \sec^2 A - 8 \tan^2 A = \underline{\hspace{2cm}}$
- a) 1    b)  $-8$     c) 8    d) none of these
10. A die is tossed. The probability of getting an even score is  $\underline{\hspace{2cm}}$
- a)  $\frac{1}{6}$     b)  $\frac{1}{5}$     c)  $\frac{1}{3}$     d)  $\frac{1}{2}$

**Questions 11-15 fill in the blanks:**

11. Diagonals of a quadrilateral intersect proportionally. The quadrilateral is a  $\underline{\hspace{2cm}}$ .
12. A biquadratic polynomial is divided by a cubic polynomial. The remainder is of the form  $\underline{\hspace{2cm}}$
13. The entire range of outcomes in a random experiment is known as  $\underline{\hspace{2cm}}$
14. A square of side 4 cm is inscribed in a circle. Hence area of the circle not included in the square is  $\underline{\hspace{2cm}}$  ( $\pi=3.14$ )
15. The formula for solving a pair of linear equations in two variables by method of cross multiplication is  $\underline{\hspace{2cm}}$ .

**Questions 16-20 Short answer questions.**

16. Primefactorise 1587.
17. Find the sum of 50, 46, 42..... upto ten terms.
18. Find the zeroes of the polynomial  $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$
19. The length of tangent of circle drawn from a point 13 cm away from the centre is 12 cm. Find the radius of the circle.
20. ABC is an isosceles triangle with  $AB = AC$ . D and E are midpoints of AB and AC. Find the ratio of area of  $\triangle ADE$  to  $\triangle ABC$ .

**Section-B**

21. Solve the equation  $2x^2 - 2\sqrt{6}x + 3 = 0$  using quadratic formula.

**OR**

Determine the value of 'm' and 'n' for which following system of equations will have infinitely many solutions.  $(2m - 1)x + 3y - 5 = 0$  :  $3x + (n - 1)y - 2 = 0$ .

22. Draw a line segment  $AB = 8\text{cm}$  and divide it in the ratio 3 : 4

**OR**

ABC is an equilateral triangle and  $AD \perp BC$ . Prove that  $4AD^2 = 3AB^2$ .

23. Evaluate:  $\operatorname{cosec}(65^\circ + \theta) - \sec(25^\circ - \theta) - \tan 55^\circ - \cot(35^\circ + \theta)$
24. ABCD is a square of side 7 cm. From each vertex a quadrant is drawn with radius equal to half of the side. Find the area of the region of the square exterior to quadrants.
25. 50 cards are numbered 1 – 50. One card is drawn at random. What is the probability that the drawn card bears (i) a square number (ii) a multiple of 3 and 5.
26. From a pack of well shuffled cards all Hearts are removed. One card is drawn at random. What is the probability that the drawn card is a (i) face card (ii) black card.

## Section - C

27. Prove that  $\sqrt{3}$  is irrational.

**OR**

If 'x' and 'y' are two odd positive integers prove that  $x^2 + y^2$  is even but not divisible by 4.

28. Solve for 'x' and 'y':  $\frac{xy}{x+y} = \frac{6}{5}$  ;  $\frac{xy}{y-x} = 6$   $x + y \neq 0$  and  $y - x \neq 0$

29. Two stations A and B are 80 km apart. Two cars start from these stations simultaneously. If they travel in the same direction they meet in 8 hours but if they travel in the opposite direction they meet in  $\frac{4}{7}$  hours. Find the speeds of the cars.

30. Determine the ratio in which the line  $3x - 2y + 5 = 0$  divides the line joining the points (3, 2) and (-2, 7).

**OR**

Find the area of the triangle whose vertices are (3, 2), (-2, 5) and (-4, -3)

31. A square park of side 84m has circular flower beds at each corner and at the centre of the park. Each flower bed has a radius of 7m. Find the remaining area of the park and the cost of maintaining the flower beds at ₹ 15/ m<sup>2</sup>

**OR**

A bucket is in the form of a frustum of a cone whose top and base radii are 21 cm and 14 cm. If the height of the bucket is 15 cm how many litres of water it can hold?

32. ABC is right triangle right angled at B. D, E and F are points on AB, AC and BC such that DEFB is a square. Prove that  $DE^2 = AD \cdot FC$

33. ABC is a right triangle right angled at C and  $CD \perp AB$  If  $BC = a$ ,  $AB = b$  and  $CD = p$  prove that  $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{p^2}$

34. Prove:  $\frac{1-\sin A}{1+\sin A} = (\sec A - \tan A)^2$

## Section-D

35. A boat can go 36 km downstream and 16 km upstream in 5 hours. It can also go 18 km downstream and 24 km upstream in  $4\frac{1}{2}$  hours. Find the speed of stream and speed of boat in still water.

**OR**

Students of a class are made to stand in rows. If there were 2 students more in each row one row would be reduced. But had there been 4 students 3 more rows would be added. Find the number of rows and the strength of the class.

36. At 't' minutes past 2 : 00 P.M the time needed by the minute hand to show 3 :00 P.M was found to be 3 minutes less than  $\frac{t^2}{4}$  minutes. Find 't'.

37. If the mean of the following data is 38, find the missing frequency.

|           |      |       |       |       |       |       |       |
|-----------|------|-------|-------|-------|-------|-------|-------|
| Class Int | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
| Frequency | 4    | 5     | x     | 15    | 12    | 8     | 7     |

**OR**

A student noted number of cars passing through spot on a road for 100 periods of 3 minutes each and summarized it as shown in the table below. Find the mode of the data.

|             |      |       |       |       |       |       |       |       |
|-------------|------|-------|-------|-------|-------|-------|-------|-------|
| No. of cars | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
| Frequency   | 7    | 14    | 13    | 12    | 20    | 11    | 15    | 8     |

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

**OR**

ABC is an acute triangle and AD ⊥ BC Prove that  $AC^2 = AB^2 + BC^2 - 2 BC \cdot BD$

39. A circus tent is cylindrical up to a height of 3m and conical above it. The total height of the tent is 13.5 m.. Calculate cost of canvas used for the tent at ₹ 4/m<sup>2</sup> if the radius of the base is 14 m.
40. Angle of elevation of the top of a 150 m high cliff from a point on the ground is found to be 30°. After walking-horizontally-certain distance towards the cliff the angle of elevation changes to 60°. Find the distance between two observation points. ( $\sqrt{3}=1.732$ )