CLASS X
SAMPLE PAPER
MATHS

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. Decimal representation of $\frac{47}{4000}$ terminates after _____ digits.
   a) 2   b) 3   c) 4   d) 5
2. Square of a positive integer is always of the form___
   a) 3m   b) 3m or 3m+1   c) 3m +1   d) 3m or 3m +2
3. If $\frac{5}{2}$ is a zero of the polynomial $4x^2 – 4x – k$, then value of 'k' is ____
   a) 3   b) 15   c) – 15   d) 5
4. The co-ordinates of the midpoint of the line joining points (4, -5) and (- 6, 3) are__
   a) (5,4)   b) (-5, -4)   c) (-1, -1)   d) (1, 1)
5. The distance between the points (cosθ, sinθ) and (sinθ, -cosθ) is_____
   a) √3   b)√2   c) 2   d) 1
6. If the distance between the points (4,p) and (1,0) is 5 units, then 'p' is ___
   a) ±4   b) 4   c) – 4   d) 0
7. If 4tanθ = 3, value of $\frac{4sin\theta+3cos\theta}{4sin\theta-2cos\theta}$ is ____
   a) 5/3   b) 6   c) – 6   d) Not defined.
8. If A + B = 90° and cosB = ⅗, then sin A is _____
   a) ⅗   b) ⅖   c) 1   d) none of these.
9. If 5θ and 4θ are acute angles and sin5θ = cos4θ, then 2sin3θ - √3tan3θ is____

a) 1   b) – 1   c) 0   d) 1+√3

10. Twenty cards are numbered 1 – 20. One card is picked at random. The probability of crd bearing a prime number is ___
    a) ⅖   b) ⅗   c) ¼   d) 7/20

Questions (11-15) fill in the blanks:

11. The discriminant of the equation √3x^2 + 2√2 x – 2 √3 = 0 is _____
12. Radius of a circle is do-ubled. Then the percent increase in its area is _____
13. Formula for finding Mode is _____ **OR** Formula for finding Median is _____
14. A circle is inscribed in a quadrilateral ABCD. Then AB + DC = _____
15. Given 2x + 3y =7, An equation that would make the system of equations inconsistent is_

Questions(16-20) Short answer questions.

16. If H.C.F of 45 and 63 can be expressed as 45m – 63 X2, then find 'm'.

OR

Find the largest number that divides 126, 144 and 198 completely.

17. For what value of 'k' the system of equations 2x + 3y = 5 ; 4x – ky = 10 will have infinitely many solutions.
18. For what value of 'k' the equation x^2 – 8x +k = 0 will have equal roots?
19. A tangent is drawn to a circle from a point 10 cm away from the centre is inclined at 30⁰ to the line joining the point with the centre. Find the length of the tangent.
20. In ΔABC, DE ∥ BC. If AB = 5 cm, AC = 7 cm and AD = 3 cm find the length of EC.

Section-B

21. Draw a line segment AB = 6 cm and divide it in the ratio 3 : 2.

OR

Draw a circle of radius 2 cm and construct a tangent to it from a point on the circle.

22. Find the zeroes of the polynomial 4√3x^2 + 5x – 2 √3 and verify the relationship with the coefficients.

OR

If the squared difference between the zeroes of the polynomial x^2 + px + 45 is 144 find the value of 'p'.

23. Evaluate: $\frac{2}{3}(cos^4\theta - sin^4\theta) - 3(sin^2 60° - sec^2 45°) + \frac{1}{4}cot^2 30°$
24. AOB is the diameter of a circle with centre 'O'. AC and BC are two chords measuring 3 cm and 4 cm respectively. Find the area of the minor segments formed by chords AC and BC. (π = 3.14)
25. Find the mean of the following data by Direct method.

Class Int	0-10	10-20	20-30	30-40
Frequency	7	10	15	8

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26. Two dice were tossed together. Find the probability of (i) both showing same score and (ii) sum of the scores is less than 6.

Section-C

27. Prove that √3 is irrational.

OR

Show that only one of 'n, n+1, n+2' is divisible by 3.

28. For what value of '*a*' and '*b*' the following system of equations will have infinitely many solutions. *2x – (2a+5)y = 5 ; (2b+1)x – 9y = 15.*

29. A lending library has fixed charge for the first three days and an additional charge thereafter. Savita pays ₹ 27 for a book kept for 7 days while Shriya paid ₹ 21 for a book kept for 5 days. Find the fixed charge and charge for extra day.

30. If the co-ordinates of the midpoints of a triangle are (1, 2), (0, - 1) and (2, - 1) find the co-ordinates of the vertices of the triangle.

OR

The vertices of a ΔABC are A(-2, 1), B(5, 4) and C (2, -3). Find the area of the triangle and the length of the altitude through A.

31. A circle is inscribed in a quadrilateral ABCD. Prove that the opposites sides subtend supplementary angles at the centre.

32. Two poles of height '*a*' and '*b*' meters are '*p*' meters apart. Prove that the height of the intersection of lines joining the top of one pole with the foot of the other is given by $\frac{ab}{a+b}$ m.

33. Prove : $\frac{1+cos\theta+sin\theta}{1+cos\theta-sin\theta} = \frac{1+sin\theta}{cos\theta}$ **OR** $\frac{tan^3\theta}{1+tan^2\theta} + \frac{cot^3\theta}{1+cot^2\theta} = sec\theta cosec\theta - 2sin\theta cos\theta$

34. ΔABC is right angled at B. With AC as diameter a semicircle is drawn and with BC as radius a quadrant is drawn. If AC = 5 cm and BC = 3cm find the area of the region between the semicircle and quadrant.(π = 3.14)

Section-D

35. Raju travels 600 km to his home partly by train and partly by car. If he travels 300 km by train and rest by car he would reach in 6 hours and 45 minutes, but if he travels 320 km by car rest by train he would take 3 minutes longer. Find the speeds of car and train.

OR

There are 20 coconut saplings planted in a row 10 m apart from each other. A gardener has to water these saplings one by one by fetching water from a well which is located 10 m away from first sapling. Find the distance covered in watering all plants and the time taken to complete the job if the speed of the gardener is 10 m /minute.

36. Find all zeroes of the polynomial $2x^4 - 2x^3 - 7x^2 + 3x + 6$ if two of the zeroes are $\sqrt{\frac{3}{2}}$ and $-\sqrt{\frac{3}{2}}$

37. If $\sin\theta - \cos\theta = \sqrt{2}\cos\theta$ prove that $\sin\theta + \cos\theta = \sqrt{2}\sin\theta$

OR

Angle of elevation of a jet flying horizontally at height of 3000m was found to be 45°. After a flight of ten seconds the angle of elevation changes to 60°. Find the speed of the jet.($\sqrt{3}$ = 1.732)

38. A cone of height 40 cm is cut horizontally by a plane parallel to the base. If the volume of the smaller cone so formed is 1/64 of the original cone find at what height the section has been made.

OR

A solid is in the form of a cylinder with hemispherical ends. If the total height of the solid is 19 cm and diameter of the cylinder is 7 cm find the volume and total surface area.

39. ΔABC is right angled at B and D and E are points on BC such that BD =DE = EC. Then prove that $8AE^2 = 5AD^2 + 3AC^2$.

40. If the median of the following data is 32.5 find the missing frequencies.

Class Int	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Total
Freq	x	5	9	12	y	3	2	40