INFINITY THINK BEYOND.....

AN EDUCATIONAL INSTITUTE

X MIND CURVE Mid Term Maths Half Yearly 2025-26

Test 06

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S no	Syllabus Covered	Chapters(In Half Yearly)	Marking Scheme
1	Unit 1 Number System	Real Numbers	10
2	Unit 2 Algebra	Polynomials Linear Equation In 2 Var. Quadratic Equation Arithmetic Expression	35
3	Unit 3 Geometry	Similar Triangles	10
4	Unit 4 Coordinate Geometry	Coordinate Geometry	10
5	Unit 5 Trigonometry	Intro To Trigonometry Application of Trigonometry	15

Note: Students/Teachers can refer to this Sample Paper for practice purpose. However, students may find or experience different exam pattern as syllabus or marking scheme may vary school to school.

MM:80	GENERAL INSTRUCTIONS	Time :3Hrs

READ CAREFULLY ALL INSTRUCTIONS

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E.
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.
9. This paper consists of 38 questions.
    a. Write your answers neatly and legibly.
    b. Ensure you have not left any question unanswered

SECTION – A

Questions 1 to 20 carry 1 mark each.

1. If $2^{x-y} = 8$ and $2^{x+y} = 64$, then value of x and y are

(a) $\frac{9}{2}, \frac{3}{2}$ (b) $\frac{-9}{2}, \frac{3}{2}$ (c) $\frac{9}{2}, \frac{-3}{2}$ (d)3,2

2. If p and q are two consecutive natural numbers, then HCF (p, q) is

(a) q (b) p (c) 1 (d) pq

3. If the lines given by $3x+2ky=2$ and $2x+5y+1=0$ are parallel, then the value of k is

(a) $-\frac{5}{4}$ (b) $\frac{2}{5}$ (c) $\frac{15}{4}$ (d) $\frac{3}{2}$

4. If $\sec\theta+\tan\theta=x$, then $\tan\theta$ equals

(a) $\frac{2}{x}$ (b) $\frac{1}{2x}$ (c) $\frac{x^2-1}{2x}$ (d) $\frac{2x}{x^2-1}$

5. A pair of irrational numbers whose product is a rational number is

(a) $\sqrt{3},\sqrt{6}$ (b) $\sqrt{25},\sqrt{4}$ (c) $3\sqrt{5}, 5\sqrt{3}$ (d) $\sqrt{3}, \sqrt{12}$

6. The lines $2x+3y=8$ and $16x+24y=64$ are

(a) parallel (b) intersecting (c) overlapping (d) None of these

7. If ABCD is parallelogram, P is a point on side BC and DP when produced meets AB produced at L, then select the correct option

(a) $\frac{DP}{BL}=\frac{DC}{PL}$ (b) $\frac{DP}{PL}=\frac{DC}{BL}$ (c) $\frac{DP}{PL}=\frac{BL}{DC}$ (d) $\frac{DP}{PL}=\frac{AB}{DC}$

8. The value of $(1-\tan\theta+\sec\theta)(1-\cot\theta+\operatorname{cosec}\theta)$ is

(a) 1 (b) –1 (c) –2 (d) 2

9. If sinx +cosecx=2, then $\sin^{19}x+\operatorname{cosec}^{20}x$ is

(a) 2^{19} (b) 2^{20} (c) 2 (d) 2^{39}

10. D and E are respectively the midpoint on the sides AB and AC of a ΔABC and $BC=6$ cm. If DE||BC, then the length of DE (in cm) is

(a) 2.5 (b) 3 (c) 5 (d) 6

11. The least number that is divisible by all the numbers from 1 to 10 (both included) is

(a) 2250 (b) 1000 (c) 2500 (d) 2520

12. What is the HCF of two consecutive even numbers?

(a) 8 (b) 4 (c) 2 (d) 1

13. The sum of the digit of a two digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is

(a) 25 (b) 72 (c) 60 (d) 36

14. Two positive integers expressed as $p=ab^2$ and $q=a^2b$, where a and b are prime numbers. Then the LCM of p and q is

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

15. If one zero of the polynomial $3x^2+8x+k$ is the reciprocal of the other, then the value of k is

(a) 3 (b) 83 (c) $\frac{1}{3}$ (d) $-\frac{1}{3}$

16. The next term of the A.P. : $3, 1, -1, -3, \ldots$ is

(a) 5 (b) –4 (c) –5 (d) 0

17. If the Discriminant (D) of the equation $6x^2-bx+2=0$ is 1, then the value of 'b' is

(a) 7 (b) –7 (c) ±7 (d) $\pm\sqrt{7}$

18. If 18, x, y, –3 are in A.P., then value of $(x+y)$ is

(a) 12 (b) 15 (c) 16 (d) 11

19. Assertion: $\sqrt{2}(5-\sqrt{2})$ is an irrational number

Reason: Product of two irrational numbers is always irrational

(a) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion

(b) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.

(c) assertion is true but the reason is false.

(d) both assertion and reason are false.

20. Assertion: The point (0, –8) lies on y-axis
Reason: The x coordinate of any point on y-axis is always zero
(a)both Assertion and reason are correct and reason is correct explanation for Assertion
(b) both Assertion and reason are correct but reason is not correct explanation for Assertion
(c) Assertion is true but reason is false.
(d) both Assertion and reason are false

SECTION – B
Questions 21 to 25 carry 2 mark each.

21. Prove that: $\tan^2\theta+\cot^2\theta+2=\sec^2\theta.\text{cosec}^2\theta$

22. (A) The first term of an A.P. of 20 terms is 2 and the last term is 59. Find its 6th term from the end

OR

(B) Find the sum of first 22 terms of an A.P. in which $d=7$ and 22nd term is 149

23. Find k, if α and β are the zeros of x^2-3x-k such that $\alpha-\beta=1$.

24. In Find the fourth vertex D of a parallelogram ABCD whose three vertices are A(–2, 3), B(6, 7) and C(8, 3).

25. (A) If $17+3\sqrt{5}$ is an irrational number, then prove that $\sqrt{5}$ is also irrational

OR

(B) Prove that $(\sqrt{2}+\sqrt{3})^2$ is an irrational number, given that $\sqrt{6}$ is an irrational number

SECTION – C
Questions 26 to 31 carry 3 mark each

26. Through the mid-point M of the side CD of a parallelogram ABCD, the line BM is drawn intersecting AC in L and AD (produced) in E. Prove that EL =2BL

27. (A) What are the values of 'a' and 'b' if the pair of linear equations given by $2x-3y=7$ and $(a+b)x-(a+b-3)y=4a+b$ have infinite number of solutions.

28. (A) Solve for x : $2\left(\frac{2x+3}{x-3}\right)-25\left(\frac{x-3}{2x+3}\right)=5$

OR

(B) Divide 29 into two parts so that the sum of the squares of the two parts is 425.

29. Find the largest number that will divide 398,436 and 540 leaving remainder 7,11 and 13 respectively.

30. Find the ratio in which the line segment joining the points (1,-3) and (4,5) divided by the line x+2y=5.Also find the coordinate of this point on line

31. (A) If α and β are the zeroes of a polynomial $f(x)$ given by $f(x)=25x^2-15x+2$, then find a quadratic polynomial whose zeroes are $\frac{1}{2\alpha}$ and $\frac{1}{2\beta}$

OR

(B) Find the zeroes of the polynomial $p(x)=2x^2-7x-15$ and Hence find the polynomial whose zeros are reciprocal of given polynomial.

SECTION – D
Questions 32 & 35 carry 5 mark each.

32.(A) State and prove Thales theorem.

OR

(B) Sides AB and AC and median AD of a triangle ABC are respectively proportional to sides PQ and PR and median PM of another triangle PQR. Show that $\triangle ABC\sim\triangle PQR$

33. The speed of a boat in still water is 11 km/hr .It can go 12 km upstream and return downstream to the original point in 2 hours 45 minutes.Find the speed of the stream.

34. (A) Prove that : $\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\sec\theta.\text{cosec}\,\theta$

OR

(B) Prove that : $\frac{\sin\theta-\cos\theta+1}{\sin\theta+\cos\theta-1}=\frac{1}{\sec\theta-\tan\theta}$

35. A man standing on the deck of a ship, which is 10 m above water level, observes the angle of elevation of the top of a hill as 60^0 and angle of depression of the base of the hill as 30^0. Find the distance of the hill from the ship and the height of the hill.

SECTION – E
Questions 36 & 38 carry 4 mark each

36. Rishi wants to buy a car and plans to take loan from a bank. He pays his total loan amount of Rs.11,80,000 by paying every month starting with the first instalment of Rs.10,000. If he increases the instalment by Rs.1000, every month, answer the following questions.

(i) What is the amount paid by Rishi in 30th instalment?

(ii)(a)Determine the amount paid by Rishi in 30 instalments.

OR

(b)Find the difference between the amount paid in the 25th instalment and 15th instalments

(iii) What is the ratio of the 1st instalment to the 40th instalment?

37. A coaching institue of Mathematics conducts classes in two batches I and II and fees for rich and poor children are different. In batch I, there are 20 poor and 5 rich children, whereas in batch II, there are 5 poor and 25 rich children.

The total monthly collection of fees from batch I is `9000 and from batch II is `26000.

Assume that each poor child pays `x per month and each rich child pays `y per month

Based on the above information, answer the following questions.

(i) Represent the information given above in terms of x and y.

(ii)(a) Find the monthly fee paid by a poor child.

OR

(b) Find the difference in the monthly fee paid by a poor child and a rich child.

(iii) If there are 10 poor and 20 rich children in batch II, what is the total monthly collection of fees from batch II?

38. Radio frequency towers are backbone of wireless communication. A radio station tower is supported by 2 wires from the point O on the ground to the points A and B on the tower. Distance between the base of the tower and point O is 36m. From the point O, the angle of elevation of the point B is 30° and the angle elevation of the point A is 45°.

Based on the above information answer the following questions

(i)	Draw a neat labelled diagram to show the above situation.
(ii)	Find the height of point B.
(iii)	Find the length of the wire from the point O to the point A. [OR] Find the length of the wire from the point O to point B.