INFINITY THINK BEYOND.....

AN EDUCATIONAL INSTITUTE

X MIND CURVE Mid Term Maths Half Yearly 2025-26

Test 07

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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 Progression	25
3	Unit 3 Geometry	Similar Triangles	15
4	Unit 4 Coordinate Geometry	Coordinate Geometry	10
5	Unit 5 Trigonometry	Intro To Trigonometry Application of Trigonometry	20

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 | **Time : 3Hrs**

GENERAL INSTRUCTIONS

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. The pair of equations y = 0 and y = -7 has:

(a) one solution (b) two solutions

(c) infinitely many solutions (d) no solution

2. Two APs have the same common difference. The first term of one of these is –1 and that of the other is – 8. The difference between their 4th terms is

(a) 1 (b) -7 (c) 7 (d) 9

3. If △ABC ~ △DEF and AB = 3 cm, DE = 4 cm, BC = 6 cm, then EF is:

(a) 8 cm (b) 6 cm (c) 7 cm (d) 9cm

4. If the vertices of a parallelogram PQRS taken in order are P(3,4), Q(-2,3) and R(-3,-2), then the coordinates of its fourth vertex S are

(a) (-2,-2) (b) (-2,-3) (c) (2,-1) (d) (1,2)

5. Let a and b two positive integers such that a = p^3q^4 and b = p^2 q^3, where p and q are prime numbers . If HCF (a,b) = p^mq^n and LCM (a,b) = p^rq^s , then (m+n)(r+s) =

(a) 15 (b) 30 (c) 35 (d)72

6. Let p be a prime number. The quadratic equation having its roots as factors of p is

(a) x^2 –px +p=0 (b) x^2–(p+1)x +p=0

(c) x^2+(p+1)x +p=0 (d) x^2 –px+p+1=0

7. If sinθ + cosθ = √2, then tanθ + cot θ =

(a) 1 (b) 2 (c) 3 (d) 4

8. If x tan 60°cos 60°= sin60°cot 60°, then x =

(a) cos30° (b) tan30° (c) sin30° (d) cot30°

9. If α and β are the zeros of a polynomial f(x) = px^2 – 2x + 3p and α + β = αβ, then p is

(a)$\frac{-2}{3}$ (b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $\frac{-1}{3}$

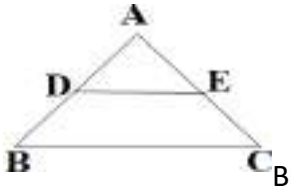
10. If triangles ABC and DEF are similar and AB=4 cm, DE=6 cm, EF=9 cm and FD =12cm , the perimeter of triangle ABC is:

(a) 22 cm (b) 20 cm (c) 21 cm (d) 18 cm

11. In the given figure, DE ‖ BC, AE = a units, EC =b units, DE =x units and BC = y units. Which of the following is true?

(a) x = $\frac{a+b}{ay}$ (b) y = $\frac{ax}{a+b}$

(c) x = $\frac{ay}{a+b}$ (d) $\frac{x}{y} = \frac{a}{b}$



12. ABCD is a trapezium with AD ‖ BC and AD = 4cm. If the diagonals AC and BD intersect each other at O such that $\frac{AO}{OC} = \frac{DO}{OB} = \frac{1}{2}$, then BC =

(a) 6cm (b) 7 cm (c) 8cm (d) 9cm

13. The midpoint of a line segment joining two points A(2, 4) and B(-2, -4) is

(a)(-2,4) (b) (2,-4) (c) (0,0) (d) (-2,-4)

14. If zeroes of p(x) = $2x^2$ − 7x + k reciprocal of each other then value of k?

(a) 1 (b) 2 (c) 3 (d) −7

15. If 5 tanβ =4, then $\frac{5\sin\beta - 2\cos\beta}{5\sin\beta + 2\cos\beta}$ =

(a) $\frac{1}{3}$ (b) $\frac{2}{5}$ (c) $\frac{3}{5}$ (d) 6

16. Which term of the A.P. 3, 8, 13, 18, … is 78?

(a) 12^{th} (b) 13^{th} (c) 15^{th} (d) 16^{th}

17. If O($\frac{P}{3}$, 4) is the midpoint of the line segment joining the points P(-6, 5) and Q(-2, 3), then the value of p is:

(a) $\frac{7}{2}$ (b) -12 (c) 4 (d) -4

18. AB is a chord of the circle and AOC is its diameter such that angle ACB = 50^0 .If AT is the tangent to the circle at the point A, then BAT is equal to

(a) 65°. (b) 60°. (c) 50°. (d) 40°.

19. Assertion: If the co-ordinates of the mid-points of the sides AB and AC of ΔABC are D(3,5) and E(-3,-3)

respectively, then BC = 20 units

Reason: The line joining the mid points of two sides of a triangle is parallel to the third side and equal to half of it

(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: If product of two numbers is 5780 and their HCF is 17, then their LCM is 340.

Reason: HCF is always a factor of LCM

(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

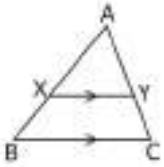
(c) Assertion is true but reason is false.

(d) both Assertion and reason are false

SECTION – B

Questions 21 to 25 carry 2 mark each.

21. In the given figure, X Y ‖ BC. If AB=4BX and YC=2cm , then find AY.



22. Solve the following pair of linear equations for x and y.

$mx - ny = m^2 + n^2$

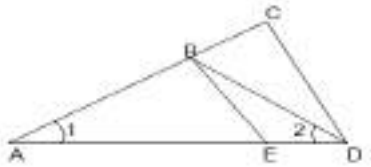
$x + y = 2m$

23. (A) Find the middle term of the AP 6, 13, 20, ...,216.

OR

(B) How many terms are there in A.P. whose first and fifth term are – 14 and 2, respectively and the last term is 62.

24. In the given figure below, $\frac{AD}{AE} = \frac{AC}{BD}$ and $\angle 1 = \angle 2$. Show that $\Delta BAE \sim \Delta CAD$.



25. (A) If $\sin(A+B) = 1$ and $\cos(A-B) = \frac{\sqrt{3}}{2}$, $0° < A+B \leq 90°$ and $A > B$, then find the measures of angles A and B

OR

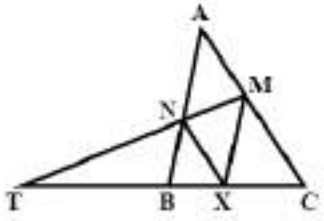
(B) Find an acute angle θ when $\frac{\cos\theta - \sin\theta}{\cos\theta + \sin\theta} = \frac{1-\sqrt{3}}{1+\sqrt{3}}$

SECTION – C

Questions 26 to 31 carry 3 mark each

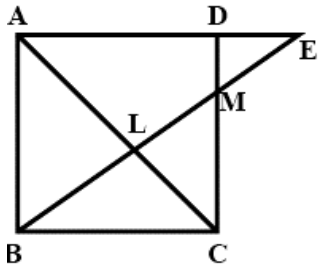
26. In a painting competition of a school, a student made a flag whose perimeter was 50 cm. Its area will be decreased by $6cm^2$, if length is decreased by 3cm and breadth is increased by 2cm, then find the dimensions of the flag

27. (A) Let X be any point on the side BC of a triangle ABC .If XM , XN are drawn parallel to BA and CA meeting CA ,BA in M,N respectively :MN meets BC produced in T ,prove that $TX^2 = TB \times TC$



OR

(B) In fig. M is a mid point of side CD of a parallelogram ABCD. The line BM is drawn intersecting AC at L and AD produced a E .Prove that EL = 2BL



28. Given that $\sqrt{3}$ is irrational, prove that $5 + 2\sqrt{3}$ is irrational

29. If the zeroes of the polynomial x^2 +px +q are double in value to the zeroes of the polynomial $2x^2$ -5x -3, then find the values of p and q.

30. If the sum of first 6 terms of an A.P. is 36 and that of the first 16 terms is 256, find the sum of first 10 terms.

31. Prove the following that: $\frac{\tan^3\theta}{1+\tan^2\theta} + \frac{\cot^3\theta}{1+\cot^2\theta} = \sec\theta\,\mathrm{cosec}\theta - 2\sin\theta\cos\theta$

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

32. (A) Prove that if a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio.

OR

(B) Using the above theorem prove that a line through the point of intersection of the diagonals and parallel to the base of the trapezium divides the non parallel sides in the same

33. If we add 1 to the numerator and subtract 1 from the denominator, a fraction becomes 1. It also becomes 1/2 if we only add 1 to the denominator. What is the fraction

34. (A) To fill a swimming pool two pipes are used. If the pipe of larger diameter used for 4 hours and the pipe of smaller diameter for 9 hours, only half of the pool can be filled. Find, how long it would take for each pipe to fill the pool separately, if the pipe of smaller diameter takes 10 hours more than the pipe of larger diameter to fill the pool?

OR

(B) In a flight of 600km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr from its usual speed and the time of the flight increased by 30 min. Find the scheduled duration of the flight

35. Prove that :

(i) $\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + \tan\theta + \cot\theta$

(ii) (a)$\mathrm{cosec}^6\theta = \cot^6\theta + 3\cot^2\theta\,\mathrm{cosec}^2\theta + 1$

OR

(b)If $\cot\theta = \frac{1}{\sqrt{3}}$, find the value of $\frac{1-cos^2\theta}{2-sin^2\theta}$

SECTION – E
Questions 36 & 38 carry 4 mark each

36. Friends Forever: Ramu and Somu are best friends. One day Ramu had to go overseas for higher studies by ship. Two ships C and D are on either side of a light house AB in such a way that the ships and the light house are in the same straight line. Ramu standing on the deck of ship C which is 10 m above the water level, waves to Somu standing on the top of the light house at an angle of

elevation of 30°. Distance between Ramu and Somu is 100 m. Somu observes ship D at an angle of depression of 60°.(Use √3 = 1.73).

Based on the above information answer the following questions

(i) Draw a neat labelled figure to show the above situation diagrammatically.

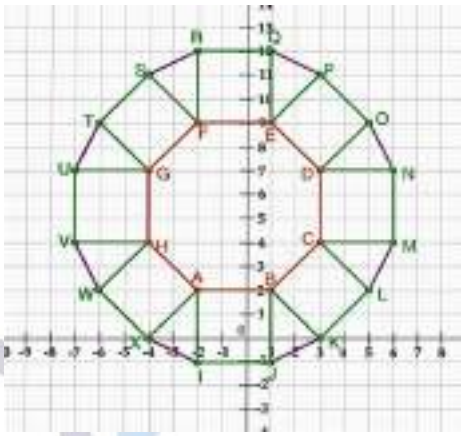
(ii) Find the height of the light house.

(iii) (a)Find the distance between the ships.

OR

(b)Find the distance between Somu and the ship D.

37. A craftsman thought of making a floor pattern after being inspired by the above design. To ensure accuracy in his work, he made the pattern on the Cartesian plane. He used regular octagons, squares and triangles for his floor tessellation pattern.



Use the above figure to answer the questions that follow:

(i) What is the length of the line segment joining points B and F?

(ii) The centre 'Z'of the figure will be the point of intersection of the diagonals of quadrilateral WXOP. Then what are the coordinates of Z?

(iii) (a)What are the coordinates of the point on y axis equidistant from A and G?

OR

(b)What is the area of Trapezium AFGH?

38. A road roller is a compactor-type engineering vehicle used to compact soil, gravel, concrete, or asphalt in the construction of roads and foundations. Similar rollers are used also at landfills or in agriculture. RCB Machine Pvt Ltd started making road roller 10 year ago. Company increased its production uniformly by fixed number every year. The company produces 800 roller in the 6th year and 1130 roller in the 9th year.

On the basis of the above information, answer the following questions :

(i) What was the company's production in first year?

(ii) What was the increase in the company's production every year?

(iii)(a) In which year the company's production was 1350 rollers?

OR

(b)What was the company's production in the 8th year?