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X**MIND CURVE** Mid Term Maths Half Yearly 2026-27**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 Progression	20
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	15
6	Unit 7 Statistics & Probability	Statistics Probability	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.

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 $\triangle ABC \sim \triangle DEF$ 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 $b = p^2q^3$, 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 $\sin\theta + \cos\theta = \sqrt{2}$, then $\tan\theta + \cot\theta =$

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

8. If $x \tan 60^\circ \cos 60^\circ = \sin 60^\circ \cot 60^\circ$, then $x =$

- (a) $\cos 30^\circ$ (b) $\tan 30^\circ$ (c) $\sin 30^\circ$ (d) $\cot 30^\circ$

9. If α and β are the zeros of a polynomial $f(x) = px^2 - 2x + 3p$ and $\alpha + \beta = \alpha\beta$, then p is

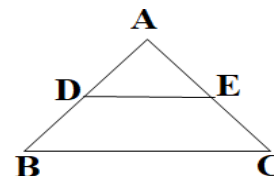
- (a) $-\frac{2}{3}$ (b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $-\frac{1}{3}$

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

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

11. In the given figure, $DE \parallel BC$, $AE = a$ 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 $AD \parallel BC$ and $AD = 4$ cm. 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) 6 cm (b) 7 cm (c) 8 cm (d) 9 cm

13. How many three- digit numbers are divisible by 7?

- (a) 117 (b) 143 (c) 128 (d) 158

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 $5 \tan \beta = 4$, 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) 12th (b) 13th (c) 15th (d) 16th
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. For the following distribution, upper limit of median class

Class	0-5	6-11	12-17	18-23	24-29
Frequency	13	10	15	8	11

- (a) 18.5 (b) 20.5 (c) 25.5 (d) 17.5
19. **Assertion:** If the co-ordinates of the mid-points of the sides AB and AC of $\triangle ABC$ 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. There are 20 numbered cards with labelled 1 to 20 Rahul and his friends put all the number cards in the empty chalk box available in the classroom. If Rahul picks up any card randomly, then find the probability of getting :
- i) a Prime Number
 ii) a multiple of 6

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

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

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

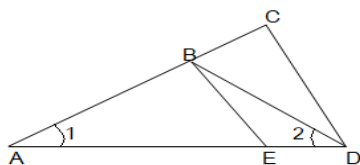
$$x + y = 2m$$

23. (A) Find the ratio in which the line segment joining $A(1, -5)$ and $B(-4, 5)$ is divided by X-axis .Also find the co-ordinate of the point of division.

OR

(B) Find the ratio in which line segment A(2,-3) and B(3,7) divides the line $x-3y=7$.

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



25. (A) If $\sin(A+B)=1$ and $2\cos(A-B)=\sqrt{3}$, $0^\circ < A+B \leq 90^\circ$ and $A > B$, 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. The marks obtained by 30 students of class 10th of a certain school in Maths test consisting of 100 marks are presented in table below .

CI	10-25	25-40	40-55	55-70	70-85	85-100
Number of Students	2	p	7	6	6	6

Find p and also find the mean marks.

27. A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is
 (i) either a black card or a queen.
 (ii) neither a red card nor a king.
 (iii) a black card and a king.

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 identity.

$$\frac{(1+\cot A + \tan A)(\sin A - \cos A)}{\sec^3 A - \operatorname{cosec}^3 A} = \sin^2 A \cos^2 A$$

OR

Prove that $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A = \frac{\sin A}{1 - \cos A}$

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.

(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 $\frac{1}{2}$ 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. Given below is the record of a survey of 80 patients admitted in a hospital.

Age (in years)	Below 15	Below 25	Below 35	Below 45	Below 55	Below 65
No. of patients	6	17	38	61	75	80

Find the Median of the given data and the Modal age of the patients admitted.

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 $\sqrt{3} = 1.73$).

Based on the above information answer the following questions

- Draw a neat labelled figure to show the above situation diagrammatically.
- Find the height of the light house.
- (a) Find the distance between the ships.

OR

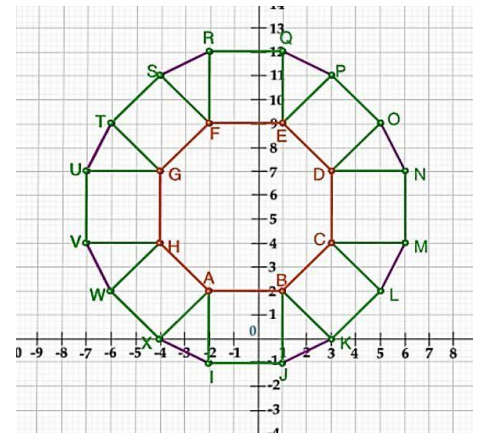
- (b) Find the distance between Somu and the ship D.



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?

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