

Half Yearly Maths **MIND CURVE** Practice Paper Series 2023-24

By Deepika Bhati Teaching Mathematics Passionately since 2009

S no	Syllabus Covered	Chapters(In Half Yearly)	Marking Scheme
1.	Unit 1 Number System	Real Numbers	7
2.	Unit 2 Algebra	Polynomials Linear Equation In 2 Var. Quadratic Equation Arithmetic Expression	21
3.	Unit 3 Geometry	Similar Triangles	12
4.	Unit 4 Coordinate Geometry	Coordinate Geometry	10
5.	Unit 5 Trigonometry	Intro To Trigonometry	12
6.	Unit 6 Mensuration	Area Related To Circles	8
7.	Unit 7 Stats & Probability	Statistics Probability	10

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:3 Hrs

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 $\pi = 22/7$ 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 (1 Marker)

1. HCF of the smallest composite number and smallest prime number is:

(a) 4
(b) 2
(c) 4
(d) 0
2. If $p(x)$ is a polynomial of at least degree one and $p(k) = 0$, then k is known as

(a) value of $p(x)$
(b) zero of $p(x)$

(c) constant term of $p(x)$
(d) none of these
3. If a is an odd number, b is not divisible by 3 and LCM of a and b is P then the LCM of $3a$ and $2b$ is:

(a) $5P$
(b) $3P$
(c) $6P$
(d) $2P$
4. If $p(x) = ax^2 + bx + c$, then c/a is equal to

(a) 0
(b) 1
(c) sum of zeroes
(d) product of zeroes
5. What is the HCF of $3^3 \times 5$ and $3^2 \times 5^2$?

(a) 45
(b) 225
(c) 15
(d) 60
6. The positive root of $\sqrt{3x^2 + 6} = 9$

(a) 3
(b) 4
(c) 5
(d) 7
7. The value of k for which the system of equations $x + y - 4 = 0$ and $2x + ky - 3 = 0$, has no solution, is

(a) -2
(b) $\neq 2$
(c) 3
(d) 2
8. The distance of the point $P(-6, 8)$ from the origin is

(a) 8
(b) $2\sqrt{7}$
(c) 10
(d) 6
9. While computing mean of grouped data, we assume that the frequencies are

(a) evenly distributed over all the classes
(b) centred at the classmarks of the classes

(c) centred at the upper limits of the classes
(d) centred at the lower limits of the classes
10. The point on x-axis which is equidistant from the points $(5, -2)$ and $(-3, 2)$ is

(a) $(0, 1)$
(b) $(-1, 0)$
(c) $(1, 0)$
(d) $(0, 9)$
11. AD and PM are medians of triangles ABC and PQR respectively where $\Delta ABC \sim \Delta PQR$. Then $\frac{AB}{PQ}$ equals

(a) $\frac{AC}{MR}$
(b) $\frac{AD}{MP}$
(c) $\frac{AC}{PM}$
(d) $\frac{AD}{QM}$
12. A ticket is drawn at random from a bag containing tickets numbered from 1 to 40. The probability that the selected ticket has a number which is a multiple of 5 is

(a) $3/5$
(b) $1/5$
(c) $1/3$
(d) $4/5$
13. If a pair of linear equations is consistent, then the lines will be

(a) parallel
(b) always coincident

(c) intersecting or coincident
(d) always intersecting
14. In ΔABC , right-angled at B , $AB = 5$ cm and $\angle ACB = 30^\circ$ then the length of the side AC is

- (a) $5\sqrt{3}$ (b) $2\sqrt{3}$ (c) 10 cm. (d) none of these

15. Which of the following equations has -1 as a root?

- (a) $x^2 + 3x - 10 = 0$ (b) $x^2 - x - 12 = 0$
 (c) $3x^2 - 2x - 5 = 0$ (d) $9x^2 + 24x + 16 = 0$

16. $9\sec^2 A - 9\tan^2 A =$

- (a) 1 (b) 9 (c) 8 (d) 0

17. Which one of the following is not a quadratic equation?

- (a) $(x + 2)^2 = 2(x + 3)$ (b) $x(x - 1) + 8 = (x - 2)(x - 2)$
 (c) $(x + 2)(x - 1) = x^2 - 2x - 3$ (d) $x^3 - x^2 + 2x + 1 = (x + 1)^3$

18. A lot consists of 144 ball pens of which 20 are defective and the others are good. Tanu will buy a pen if it is good but will not buy if it is defective. The shopkeeper draws one pen at random and gives it to her. The probability that she will buy that pen is

- (a) $5/36$ (b) $20/36$ (c) $31/36$ (d) $31/144$

19. Assertion (A): If m and n are odd positive integers, then $m^2 + n^2$ is even but not divisible by 4.

Reason (R): $3 \times 5 \times 7 + 7$ is a composite number

- 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 correct but reason is false
 d) Assertion is false but reason is true.

20. Assertion (A): In a circle of radius 6 cm, the angle of a sector is 60° . Then the area of the sector is $132/7 \text{ cm}^2$.

Reason (R): Area of the circle with radius r is πr^2 .

- 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 correct but reason is false
 d) Assertion is false but reason is true.

Section B (2 Marker)

21. If $ad \neq bc$, then prove that the equation

$$(a^2 + b^2)x^2 + 2(ac + bd)x + (c^2 + d^2) = 0 \text{ has no real roots.}$$

Or

The sides of two square plots are $(2x - 1)m$ and $(5x + 4)m$. The area of the second square plot is 9 times the area of the first square plot. Find the side of the larger plot.

22. If $\tan \theta + \cot \theta = 5$, find the value of $\tan^2 \theta + \cot^2 \theta$.

Or

$\sin(A - B) = \frac{1}{2}$, $\cos(A + B) = \frac{1}{2}$ find A and B

23. If $\triangle ABC \sim \triangle PQR$, perimeter of $\triangle ABC = 32$ cm, perimeter of $\triangle PQR = 48$ cm and $PR = 6$ cm, then find the length of AC.
24. The probability of selecting a red ball at random from a jar that contains only red, blue and orange balls is $\frac{1}{4}$. The probability of selecting a blue ball at random from the same jar is $\frac{1}{3}$. If the jar contains 10 orange balls, find the total number of balls in the jar.

Section C (3 Marker)

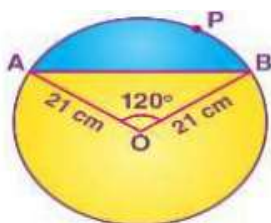
25. The wheel of a motor cycle is of radius 35 cm. How many revolutions per minute must the wheel make so as to keep a speed of 66 km/h?
26. A part of monthly hostel charge is fixed and the remaining depends on the number of days one has taken food in the mess. When Swati takes food for 20 days, she has to pay Rs 3,000 as hostel charges whereas Mansi who takes food for 25 days ₹3,500 as hostel charges. Find the fixed charges and the cost of food per day.
27. If $x = p \sec \theta + q \tan \theta$ and $y = p \tan \theta + q \sec \theta$, then prove that $x^2 - y^2 = p^2 - q^2$.
28. A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.
29. During a sale, Color pencils were being sold in pack of 24 each and crayons in pack of 32 each. If you want full packs of both the same number of pencils and crayons, how many of each would you need to buy?
30. Prove the following identity:
- $$\frac{\sin^3 \theta + \cos^3 \theta}{\sin \theta + \cos \theta} = 1 - \sin \theta \cdot \cos \theta$$
31. Find the value of k, if the sum of the zeroes of the polynomial $x^2 - (k + 6)x + 2(2k - 1)$ is half of their product. Hence find $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$ where α and β are zeros of above polynomial.

Or

If α and β are the zeros of the polynomial $x^2 + 5x + k$, and $\alpha^3 + \beta^3 = 11$ find k.

Section D (5 Marker)

32. Prove that $\sqrt{7}$ is an irrational number. Hence Prove that $\frac{1}{\sqrt{7}-2}$ is irrational
33. Find the area of the segment APB shown in the figure, if the radius of the circle is 21 cm and $\angle AOB = 120^\circ$. (Use $\pi = \frac{22}{7}$).



34. 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 $\Delta ABC \sim \Delta PQR$.

Or

CD and GH are respectively the bisectors of $\angle ACB$ and $\angle EGF$ such that D and H lie on sides AB and FE of ΔABC and ΔEFG respectively. If $\Delta ABC \sim \Delta FEG$, Show that:

(i) $CD/GH = AC/FG$ (ii) $\Delta DCB \sim \Delta HGE$ (iii) $\Delta DCA \sim \Delta HGF$

35. Following table shows the daily pocket allowances given to the children of a multi-story building. The mean of the pocket allowances is Rs. 18. Find out the missing frequency.

Class interval	11 - 13	13 -15	15 -17	17-19	19-21	21-23	23 - 25
Frequency	3	6	9	13	?	5	4

Or

For the following distribution find the modal class .

Class interval	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60	Below 70
Frequency	8	17	32	62	80	95	100

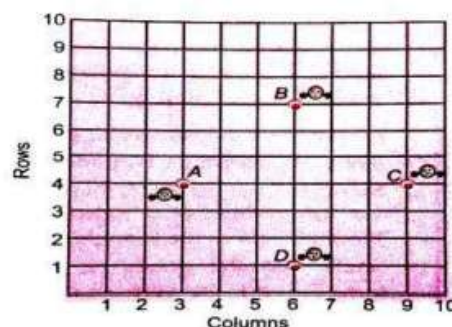
Section E (4 Marker)

36. In a classroom, four friends are seated at the points A, B, C and D as shown below. All the friends are observing this seating arrangement and ask different questions to each other. Observe the seating arrangement and help them to answer the following questions:

- Find the co-ordinates of point A and point B respectively.
- What are the coordinates of point C and D respectively?
- What is the distance between two friends seating at point A and C?

Or

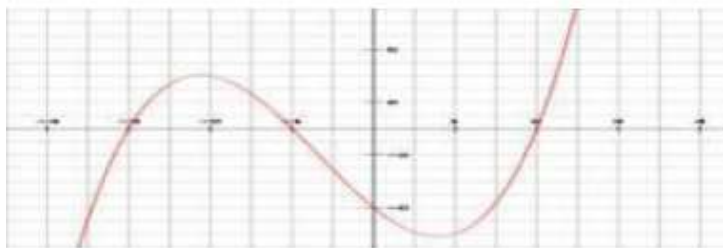
What is the distance between two friends seating at point A and B?



37. Football is played with a spherical ball. Usually, football is played outdoors on a large field.

- From adjacent figure, projectile of football form which shape and polynomial
- Form a quadratic polynomial whose one zero is reciprocal of other such that sum of root is 10.





(iii) Find three zeroes in the adjacent shown graph and form a cubic polynomial.

Or

Find the polynomial formed by projectile of football ,if graph of projectile cut X axis at $(2,0)$ and $(-5,0)$?

38. Raju put a fence around a circular field and the total cost came upto Rs. 6000 at Rs. 30 per metre. He now wants to plough the field .using the information given , answer the following questions :

(i) What is the perimeter of field?

(ii) What is the radius of field ?

(iii) What is the circumference of the the sector with $\theta = 60^\circ$

Or

Find the area of Segment with $\theta = 90^\circ$



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