Chapter 1: Real Numbers

Name: _____ **Date:** _____ **Marks:**

A. Multiple Choice Questions (15 Questions)

1. The HCF of 16 and 24 is:

   a) 4 b) 8 c) 16 d) 48

2. If p and q are two distinct prime numbers, then their HCF is:

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

3. For any two positive integers a and b, then HCF(a, b) \times \text{LCM}(a, b)\) is equal to: a) \(a + b\) b) \(a - b\) c) \(a \times b\) d) \(a \div b\)

4. The prime factorization of 140 is: a) \(2 \times 5 \times 7\) b) \(2^2 \times 5 \times 7\) c) \(2 \times 5^2 \times 7\) d) \(2^2 \times 5^2 \times 7\)

5. Which of the following is an irrational number? a) \(\sqrt{4}\) b) \(3.14\) c) \(\sqrt{3}\) d) \(\frac{22}{7}\)

6. The product of a non-zero rational and an irrational number is: a) Always rational b) Always irrational c) One d) Zero

7. If the HCF of 26 and 91 is 13, then their LCM is: a) 182 b) 2366 c) 13 d) 91

8. The value of \(\pi\) is: a) An integer b) A rational number c) An irrational number d) A prime number

9. The LCM of 12, 15, and 21 is: a) 3 b) 420 c) 120 d) 315

10. The prime factorization of 156 is: a) \(2^2 \times 3 \times 13\) b) \(2 \times 3^2 \times 13\) c) \(2^2 \times 3^2 \times 13\) d) \(2 \times 3 \times 13\)

11. What is the greatest possible speed at which a man can walk 52 km and 91 km in an exact number of hours? a) 13 km/h b) 7 km/h c) 17 km/h d) 26 km/h

12. If \(\text{HCF}(a,b) = 12\) and \(a \times b = 1800\), then \(\text{LCM}(a,b)\) is: a) 150 b) 900 c) 120 d) 3600

13. The smallest composite number and the smallest prime number have an HCF of: a) 1 b) 2 c) 4 d) 8

14. The total number of prime factors of 1001 is: a) 2 b) 3 c) 4 d) 5

15. \(5 - \sqrt{3}\) is a/an: a) Rational number b) Irrational number c) Integer d) Prime number

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B. Fill in the Blanks (10 Questions)

16. Every composite number can be expressed as a product of _____.

17. The HCF of two distinct prime numbers is always _____.
18. $\sqrt{2}$ is an _____ number.
19. If p is a prime number and p divides a^2, then \(p\) also divides _____.
20. For any two positive integers a and b, HCF(a,b) x LCM(a,b) = _____.
21. The prime factorization of 96 is _____.
22. A number that cannot be written in the form $\frac{p}{q}$ where p and q are integers and q ≠ 0 is called an _____ number.
23. The number 1 is neither a prime nor a _____ number.
24. The LCM of 5 and 15 is _____.
25. If the HCF of two numbers is 1, the numbers are known as _____ numbers.

C. One-Mark Questions (10 Questions)

26. State the Fundamental Theorem of Arithmetic.
27. Express 156 as a product of its prime factors.
28. Find the HCF of 12 and 16.
29. If \(\text{HCF}(306, 657) = 9\), write the formula you would use to find their LCM.
30. What is the LCM of 2, 3, and 5?
31. Define an irrational number.
32. Is \(3\sqrt{2}\) a rational or an irrational number?
33. Find the prime factorization of 120.
34. What is the highest common factor (HCF) of 17 and 23?
35. State whether \(2 + \sqrt{3}\) is rational or irrational.

D. Two-Mark Questions (10 Questions)

36. Find the LCM and HCF of 26 and 91 using the prime factorization method.
37. Verify that HCF x LCM = Product of the two numbers for 336 and 54.
38. Find the HCF of 510 and 92 using prime factorization.
39. Given that HCF(252, 594) = 18, find LCM(252, 594).
40. Prove that $3 + 2\sqrt{5}$ is irrational, given that $\sqrt{5}$ is irrational.
41. Express 5005 as a product of its prime factors.
42. Check whether 6^n can end with the digit 0 for any natural number n.

43. Find the LCM and HCF of 12, 15 and 21 by applying the prime factorization method.
44. Explain why 7 x 7 + 13 +13 is a composite number.
45. The HCF of two numbers is 23 and their LCM is 1449. If one of the numbers is 161, find the other number.

E. Three-Mark Questions (5 Questions)

46. Prove that $\sqrt{10}$ is an irrational number.
47. Prove that $\sqrt{3}$ is an irrational number.
48. Prove that $5 - \sqrt{3}$ is an irrational number.
49. Find the LCM and HCF of 6, 72, and 120 using the prime factorization method.
50. Prove that $\frac{1}{\sqrt{2}}$ is an irrational number.

F. Five-Mark Questions (5 Questions)

51. (a) Prove that $\sqrt{2}$ is an irrational number. (b) Hence, show that $3 + 5\sqrt{2}$ is also an irrational number.
52. Three school bells toll at intervals of 12 minutes, 15 minutes, and 18 minutes respectively. If they all start tolling together at 9:00 AM, at what time will they next toll together? Show all your working steps clearly.
53. (a) State the Fundamental Theorem of Arithmetic.

    (b) Find the HCF and LCM of 306 and 657 and mathematically verify that HCF x LCM = Product of the two numbers.
54. A sweet seller has 420 kaju barfis and 130 badam barfis. She wants to stack them in such a way that each stack has the same number of barfis, and they take up the least area of the tray. What is the maximum number of barfis that can be placed in each stack for this purpose? Explain the mathematical concept used to arrive at the answer.
55. (a) Check whether 4^n can end with the digit 0 for any natural number n. Provide a valid mathematical reason.

    (b) Explain in detail why ((7x 6 x 5 x 4 x 3 x 2 x 1) + 5) is a composite number.

Chapter 2: Polynomials

Name: _____ **Date:** _____ **Marks:** _____

A. Multiple Choice Questions (15 Questions)

1. The highest power of the variable in a polynomial is called its:

   a) Coefficient b) Degree c) Zero d) Term

2. A polynomial of degree 2 is called a:

   a) Linear polynomial b) Cubic polynomial c) Quadratic polynomial
   d) Biquadratic polynomial

3. The number of zeros a linear polynomial can have is: a) 0 b) 1 c) 2 d) 3

4. If \(\alpha\) and \(\beta\) are the zeros of the quadratic polynomial \(ax^2 + bx + c\), then \(\alpha + \beta\) is equal to: a) \(c/a\) b) \(-b/a\) c) \(b/a\) d) \(-c/a\)

5. The geometrical representation of a linear polynomial is a: a) Straight line b) Parabola c) Circle d) Curve

6. If the sum and product of the zeros of a quadratic polynomial are 3 and -2 respectively, the polynomial is: a) \(x^2 - 3x + 2\) b) \(x^2 + 3x - 2\) c) \(x^2 - 3x - 2\) d) \(x^2 + 3x + 2\)

7. The graph of \(y = p(x)\) intersects the x-axis at exactly 4 points. The number of zeros of \(p(x)\) is: a) 1 b) 2 c) 3 d) 4

8. The zeros of the polynomial \(x^2 - 9\) are: a) 3, 3 b) 3, -3 c) -3, -3 d) 9, -9

9. The maximum number of zeros a cubic polynomial can have is: a) 1 b) 2 c) 3 d) 4

10. If 1 is a zero of the polynomial \(p(x) = ax^2 - 3(a - 1)x - 1\), then the value of \(a\) is: a) 1 b) -1 c) 2 d) -2

11. According to the division algorithm for polynomials, \(p(x) = g(x) \times q(x) + r(x)\), the degree of \(r(x)\) is always: a) Greater than the degree of \(g(x)\) b) Less than the degree of \(g(x)\) or \(r(x) = 0\) c) Equal to the degree of \(g(x)\) d) Equal to the degree of \(p(x)\)

12. The product of the zeros of the cubic polynomial \(ax^3 + bx^2 + cx + d\) is: a) \(-b/a\) b) \(c/a\) c) \(-d/a\) d) \(d/a\)

13. What is the value of the polynomial \(p(x) = x^2 - 5x + 6\) at \(x = 2\)? a) 1 b) 2 c) 0 d) -1

14. The zero of the linear polynomial \(2x + 5\) is: a) \(5/2\) b) \(-5/2\) c) \(2/5\) d) \(-2/5\)

15. If the product of the zeros of \(x^2 - 4x + k\) is 8, then the value of \(k\) is: a) 4 b) -4 c) 8 d) -8

B. Fill in the Blanks (10 Questions)

16. A polynomial of degree 3 is called a _____ polynomial.

17. The zeros of a polynomial p(x) are precisely the x-coordinates of the points where the graph y = p(x) intersects the _____ axis.
18. For a quadratic polynomial $ax^2 + bx + c$, the product of its zeros is given by the formula _____.
19. A real number k is a zero of a polynomial p(x) if p(k) = _____.
20. The graph of a quadratic polynomial is a curve called a _____.
21. A quadratic polynomial can have at most _____ distinct zeros.
22. If the sum of the zeros of the polynomial $2x^2 - kx + 5$ is 4, then the value of k is _____.
23. If p(x) is divided by g(x) and the remainder is zero, then g(x) is a _____ of p(x).
24. The general form of a linear polynomial is _____.
25. The degree of a non-zero constant polynomial is _____.

C. One-Mark Questions (10 Questions)

26. Define the degree of a polynomial.
27. Write the general form of a quadratic polynomial.
28. Find the zero of the polynomial p(x) = x - 7.
29. What is the sum of the zeros of the polynomial $x^2 + 8x + 15$?
30. Find the value of $p(x) = 3x^2 - 2x + 1$ at x = 0.
31. If the graph of a polynomial does not touch or intersect the x-axis, how many real zeros does it have?
32. Form a quadratic polynomial whose zeros are 0 and 5.
33. What is degree of quadratic equation x + 6x ?
34. Find the product of the zeros of the polynomial $4x^2 - 3x - 7$.
35. Write an example of a binomial of degree 2.

D. Two-Mark Questions (10 Questions)

36. Find the zeros of the quadratic polynomial $x^2 - 2x - 8$.
37. Find a quadratic polynomial whose sum and product of zeros are 4 and 1, respectively.
38. If the quadratic equation $x^2 + 2k + 4$, then find the value of k where x is 10.
39. Check whether (x – 1) is a factor of the polynomial $x^3 - 3x^2 + 2x$.
40. Find a quadratic polynomial whose zeros are 3 and -3.

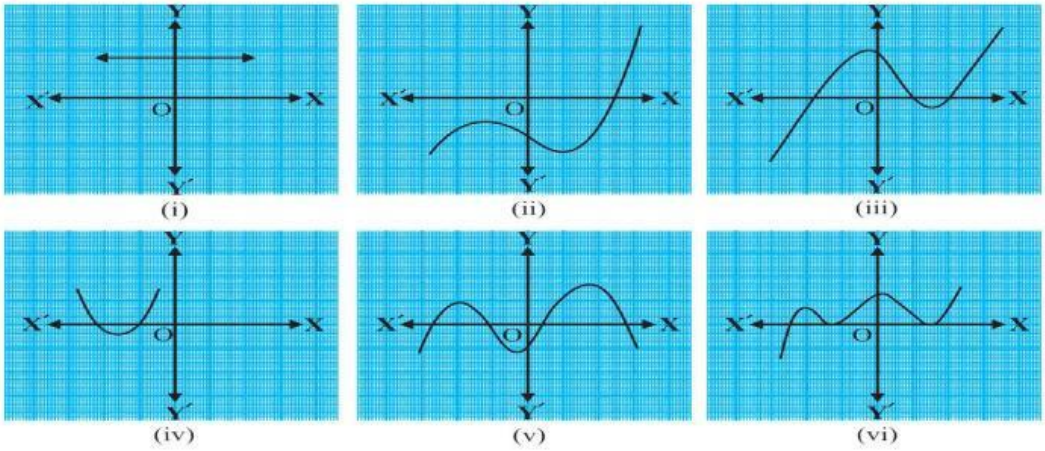
41. If one zero of the polynomial $x^2 - 4x + a$ is 2, find the value of a.
42. Find the zeros of the polynomial $4s^2 - 4s + 1$.
43. If $\alpha + \beta = 2$, then find $\alpha\beta$ where $t^2 + 4t - 5$, then find .
44. Find the value of k if $(x + 3)$ is a factor of $(3x^2 + kx + 6)$.
45. Verify whether 2 and 3 are the zeros of the polynomial $p(x) = x^2 - 5x + 6$.

E. Three-Mark Questions (5 Questions)

46. Find the zeros of the quadratic polynomial $(x^2 - 3x + 10)$ and verify the relationship between the zeros and the coefficients.
47. The polynomial $x^2 + 10x + 100$, then find the following:
    a. If one of the polynomial is 10 then find the value of x.
    b. Verify the relationship between the zeroes and the coefficients.
48. Find the zeros of the polynomial $(6x^2 - 3 - 7x)$ and verify the relationship between the zeros and the coefficients.
49. Find a quadratic polynomial whose zeros are $(2 + \sqrt{3})$ and $(2 - \sqrt{3})$.
50. If α and β are the zeros of the polynomial $x^2 - 5x + 4$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$.

F. Five-Mark Questions (5 Questions)

51. (a) Find the zeros of the quadratic polynomial $3x^2 - x - 4$ and verify the relationship between the zeros and the coefficients. (b) Find a quadratic polynomial, the sum and product of whose zeros are $\sqrt{2}$ and $\frac{1}{3}$ respectively.
52. The graphs of $y = p(x)$ are given below. Find the number of zeroes of p(x) in each case:



(i) (ii) (iii)

(iv) (v) (vi)

53. Find a quadratic polynomial of the following:-

a. 2, 3 b. $\sqrt{7}, \frac{9}{5}$

Chapter 3: Pair of Linear Equations in Two Variables

Name: _____ **Date:** _____ **Marks:** _____

A. Multiple Choice Questions (15 Questions)

1. The standard form of a linear equation in two variables is:

   a.$ax^2 + bx + c = 0$ b) $ax + by + c = 0$ where a & b ≠ 0 c) $ax^3 + by + c = 0$

   d. $\frac{a}{x} + \frac{b}{y} = c$

2. If a pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has a unique solution, then:

   a) \(a_1/a_2 = b_1/b_2\) b) \(a_1/a_2 \neq b_1/b_2\) c) \(a_1/a_2 = b_1/b_2 = c_1/c_2\) d) \(a_1/a_2 = b_1/b_2 \neq c_1/c_2\)

3. Geometrically, the pair of equations 6x - 3y + 10 = 0 and 2x - y + 9 = 0 represents two lines which are:

   a) Intersecting at exactly one point

   b) Intersecting at exactly two points c) Coincident d) Parallel

4. 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

5. The solution of the equations \(x + y = 5\) and \(x - y = 1\) is:

   a.(x = 2, y = 3) b) (x = 3, y = 2) c) (x = 4, y = 1) d) (x = 1, y = 4)

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

   a) One solution b) Two solutions c) Infinitely many solutions d) No solution

7. If the lines given by \(3x + 2ky = 2\) and \(2x + 5y + 1 = 0\) are parallel, then the value of \(k\) is: a) \(-5/4\) b) \(2/5\) c) \(15/4\) d) \(3/2\)

8. For what value of \(c\) will the equations \(cx - y = 2\) and \(6x - 2y = 3\) have infinitely many solutions? a) 3 b) -3 c) -12 d) No value

9. The graph of the equation \(x = -4\) is a line: a) Parallel to the x-axis b) Parallel to the y-axis c) Passing through the origin d) Intersecting both axes

10. A system of two linear equations in two variables is dependent and consistent if their graphs: a) Coincide b) Are parallel c) Intersect d) Do not intersect

11. The father's age is six times his son's age. If the son's age is \(x\) and the father's age is \(y\), the linear equation is: a) \(x = 6y\) b) \(y = 6x\) c) \(x + y = 6\) d) \(x - y = 6\)

12. If \(x = a\) and \(y = b\) is the solution of the equations \(x - y = 2\) and \(x + y = 4\), then the values of \(a\) and \(b\) are: a) 3 and 1 b) 1 and 3 c) 5 and 3 d) -1 and -3

13. The value of k for which the equations $x + 2y = 3$ and $5x + ky + 7 = 0$ represent inconsistent lines is: a) 10 b) 5 c) 7 d) 2

14. Half the perimeter of a rectangular garden, whose length is 4 m more than its width, is 36 m. What are the equations representing this? a) $x - y = 4$ and $x + y = 36$ b) $x + y = 4$ and $x - y = 36$ c) $x - y = 4$ and $2(x + y) = 36$ d) $x = 4y$ and $x + y = 36$

15. The intersection point of the line $3x + y = 6$ with the y-axis is: a) (2, 0) b) (0, 2) c) (0, 6) d) (6, 0)

B. Fill in the Blanks (10 Questions)

16. An equation of the form $ax + by + c = 0$, where a and b are not both zero, is called a _____ equation in two variables.

17. If $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$, the system of equations has _____ solution.

18. A pair of linear equations in two variables which has a solution is called a _____ pair of linear equations.

19. The geometrical representation of a linear equation in two variables is always a _____.

20. Two straight lines are coincident if the ratio of their coefficients satisfies the condition _____.

21. The solution of the equations $x + y = 10$ and $x = y$ is $x =$ _____ and $y =$ _____.

22. A pair of linear equations which has infinitely many solutions is called a _____ pair of linear equations.

23. The point of intersection of the line $x = a$ and $y = b$ on a Cartesian plane is _____.

24. If the graphs of two linear equations intersect at a single point, the coordinates of that point represent the _____ solution of the equations.

25. The algebraic method used to solve a pair of linear equations by substituting the value of one variable into the other equation is called the _____ method.

C. One-Mark Questions (10 Questions)

26. Write the general form of a pair of linear equations in two variables.

27. State the condition for a pair of linear equations to have infinitely many solutions.

28. Find whether the lines representing the equations 5x - 4y + 8 = 0 and 7x + 6y - 9 = 0 intersect at a point, are parallel, or are coincident.

29. Check whether x = 2 and y = 1 is a solution for the equation 2x + 3y = 7.

30. Find the number of solutions for the pair of equations x + y = 4 and 2x + 2y = 8.
31. Define an inconsistent system of linear equations.
32. Formulate a linear equation for the statement: "The cost of 2 kg of apples and 1 kg of grapes on a day was found to be Rs 160."
33. Find the value of k if the pair of equations x + 2y = 5 and 3x + ky = 15 has infinitely many solutions.
34. Do the lines 3x - y = 3 and 9x - 3y = 9 represent intersecting lines?
35. What is the solution of the pair of linear equations x = 0 and \(y = 0?

D. Two-Mark Questions (10 Questions)

36. Solve the following pair of linear equations by the substitution method x + y = 14 and x - y =7
37. Solve the following pair of linear equations by the elimination method 3x + 4y = 10 & 2x - 2y = 2.
38. Find the value of p for which the system of equations px + 3y = 1 and 12x + py = 2 has a unique solution.
39. Half the perimeter of a rectangular garden, whose length is 4 m more than its width, is 36 m. Find the dimensions of the garden.
40. Check whether the pair of equations 2x - 3y = 8 and 4x - 6y = 9 is consistent or inconsistent.
41. Formulate a pair of linear equations for the problem: "5 pencils and 7 pens together cost Rs 50, whereas 7 pencils and 5 pens together cost Rs 46."
42. Solve for x and y : s - t = 3 and s/3 + t/2 = 6.
43. For what value of k will the following pair of linear equations have no solution? 3x + y = 1 and [(2k - 1)x + (k - 1)y = 2k + 1)].
44. Find the coordinates of the point where the line 2x + 3y = 12 intersects the x-axis and the y-axis.
45. The difference between two numbers is 26 and one number is three times the other. Frame the linear equations and find the numbers.

E. Three-Mark Questions (5 Questions)

46. Solve the following pair of linear equations by the elimination method 3x - 5y - 4 = 0 and 9x = 2y + 7.
47. A fraction becomes $\frac{9}{11}$ if 2 is added to both the numerator and the denominator. If, 3 is added to both the numerator and the denominator it becomes $\frac{5}{6}$. Find the fraction.

48. Solve the following pair of equations by reducing them to a pair of linear equations: $\frac{2}{x}+\frac{3}{y}=13\ and\ \frac{5}{x}-\frac{4}{y}=-2.$

49. Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. Frame the pair of linear equations and find their present ages.

50. The sum of the digits of a two-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number.

F. Five-Mark Questions (5 Questions)

51. Solve the following pair of linear equations graphically: 2x + y = 6 and 2x - y = 2. Also, find the coordinates of the points where the lines intersect the x-axis.

52. Draw the graphs of the equations x - y + 1 = 0 and 3x + 2y - 12 = 0 . Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis, and shade the triangular region.

53. A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km downstream. Formulate the pair of linear equations and determine the speed of the stream and that of the boat in still water.

54. Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each incorrect answer, then Yash would have scored 50 marks. Formulate the equations and find how many questions were there in the test.

55. Solve the pair of linear equations graphically: x + y = 5 and x - y = 1. Find the solution and write the coordinates of the point where the lines intersect.

Chapter 4: Quadratic Equations

Name: _____ **Date:** _____ **Marks:** _____

A. Multiple Choice Questions (15 Questions)

1. The standard form of a quadratic equation is:

   a.ax + by + c = 0

   b) $ax^2 + by + c = 0$

   c) $ax^3 + by + c = 0$

   d)

2. The discriminant of the quadratic equation \(ax^2 + bx + c = 0\) is given by:

a) $\sqrt{b^2 + 4ac}$ $b) \sqrt{b^2 - 4ac}$ $c)\sqrt{b^2 \pm 4ac}$ $d)$ $\sqrt{4ac^2 + b^2}$

3. A quadratic equation has two equal real roots if its discriminant is:

   a) Greater than zero b) Less than zero c) Equal to zero d) Not a real no

4. Which of the following is not a quadratic equation?

   a) $x^2 - 4x + 4 = 0$

   b) [x(x + 2) = 5]

   c) $x^3 - x^2 = 0$

   d) $2x^2 = 8$

5. If the roots of the quadratic equation $x^2 - 4x + k = 0$ are equal, then the value of \(k\) is:

   a) 4 b) -4 c) 8 d) 2

6. The roots of the quadratic equation $x^2 - 9 = 0$ are:

   a) 3, 3 b) 3, -3 c) -3, -3 d) 9, -9

7. The maximum number of roots a quadratic equation can have is:

   a) 1 b) 2 c) 3 d) 0

8. The quadratic formula to find the roots of $ax^2 + bx + c = 0$ is:

   a) $\frac{+b-\sqrt{b^2-4ac}}{2a}$

   b) $\frac{\pm b+\sqrt{b^2-4ac}}{2a}$

   c) $\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

   d) $\frac{\pm b\pm\sqrt{b^2-4ac}}{2a}$

9. If the discriminant $b^2 - 4ac < 0$, then the quadratic equation has:

a) Two distinct real roots

b) Two equal real roots

c) No real roots

d) Infinitely many roots

10. The sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is:

a) $\frac{b}{a}$ $b) \frac{-b}{a}$ $c) \frac{c}{a}$ $d) \frac{-c}{a}$

11. The roots of the equation [(x - 2)(x + 3) = 0] are:

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

12. The discriminant of the equation $x^2 + x + 1 = 0$ is:

a.1 b) 3 c) -3 d) 0

13. The product of two consecutive positive integers is 306. The quadratic equation representing this situation is:

a) $x^2 + x - 306 = 0$

b) $x^2 - x - 306 = 0$

c) $x^2 + 2x - 306 = 0$

d) $x^2 - 2x + 306 = 0$

14. For what value of c does the equation ($x^2 - 6x + c = 0$) have equal roots?

a) 36 b) 9 c) -9 d) 6

15. If one root of the equation $2x^2 + kx - 6 = 0$ is 2, the value of k is :-

a) 1 b) -1 c) 2 d) -2

B. Fill in the Blanks (10 Questions)

16. A polynomial equation of degree 2 is called a _____ equation.

17. The value of the expression ($b^2 - 4ac$) is called the _____ of the quadratic equation.

18. If the discriminant of a quadratic equation is zero, the roots are real and _____.

19. A quadratic equation can have at most _____ real roots.

20. If ($b^2 - 4ac > 0$), the quadratic equation has two _____ real roots.

21. The roots of the equation $x^2 - 25 = 0$ are _____.

22. The formula $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ is known as the _____ formula.

23. If a quadratic equation has no real roots, then the value of its discriminant is _____ than zero.

24. The equation [x(x + 1) + 8 = (x + 2)(x - 2)] is _____ a quadratic equation. (is / is not)
25. The product of the roots of the quadratic equation $3x^2 - 5x + 2 = 0$ is _____.

C. One-Mark Questions (10 Questions)

26. Write the standard form of a quadratic equation.
27. Write the formula used to find the discriminant of a quadratic equation.
28. State the nature of the roots if the discriminant (D = 0).
29. Check whether $[(x - 2)^2 + 1 = 2x - 3]$ is a quadratic equation.
30. Find the roots of the equation $x^2 - 16 = 0$.
31. Write the quadratic formula.
32. Find the discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$.
33. What is the sum of the roots of the equation $x^2 - 7x + 10 = 0$?
34. If (x = 1) is a root of the equation $x^2 + kx + 3 = 0$, find the value of k.
35. State the nature of the roots for the equation $x^2 - x - 1 = 0$.

D. Two-Mark Questions (10 Questions)

36. Find the roots of the quadratic equation $x^2 - 5x + 6 = 0$ by factorization.
37. Find the roots of the equation $2x^2 - x - 6 = 0$ by factorization.
38. Find the discriminant of the quadratic equation $(3x^2 - 2x + \frac{1}{3} = 0)$ and hence find the nature of its roots.
39. Solve the equation $x^2 - 7x + 12 = 0$ using the quadratic formula.
40. Find the value of k for which the quadratic equation $2x^2 + kx + 3 = 0$ has two equal roots.
41. Find the roots of the quadratic equation $100x^2 - 20x + 1 = 0$.
42. The product of two consecutive positive integers is 306. Formulate the quadratic equation to find the integers.
43. Solve the equation $2x^2 - 7x + 3 = 0$ using the quadratic formula.
44. Find the roots of the quadratic equation $x^2 - 3x - 10 = 0$.
45. Find the value of k for the quadratic equation [kx(x - 2) + 6 = 0], so that it has two equal roots.

E. Three-Mark Questions (5 Questions)

46. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.

47. Find the roots of the equation $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$ where (x ≠ -4,7).

48. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

49. The sum of the reciprocals of Rehman's ages (in years) 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age.

50. Find the roots of the quadratic equation $4x^2 + 4\sqrt{3}x + 3 = 0$\) using the quadratic formula.

F. Five-Mark Questions (5 Questions)

51. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the original speed of the train.

52. Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

53. An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalore (without taking into consideration the time they stop at intermediate stations). If the average speed of the express train is 11 km/h more than that of the passenger train, find the average speed of the two trains.

54. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m. Find the length and breadth of the rectangular park.

55. (a) Find the values of \(k\) for which the quadratic equation $[(k - 12)x^2 + 2(k - 12)x + 2 = 0]$ has equal real roots.

    (b) 'A' takes 6 days less than the time taken by 'B' to finish a piece of work. If both A and B together can finish it in 4 days, find the time taken by 'B' to finish the work.