Chapter-1

Q. 1 A sweetseller has 420 *kaju barfis* and 130 *badam barfis*. She wants to stack them in such a way that each stack has the same number, 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?

Q. 2 Find the HCF and LCM of numbers (i) 196 and 38220 (ii) 229 and 27

(iii) 52 and 130

Q. 3 Given that HCF (306, 657) = 9, find LCM (306, 657).

Q. 4 Check whether 12^n can end with the digit 0 for any natural number *n*.

Q. 5 Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers.

Q. 6 Using prime factorization method find the HCF and LCM of

(i) 72, 126 and 168 (ii) 40, 36 and 126 (iii) 6, 72 and 120

Q. 7 If HCF (6, a) = 2 and LCM (6, a) = 60 then find a

Q. 8 given that LCM (77, 99) = 693, find the HCF (77, 99)

Q. 9 Find the greatest number which exactly divides 280 and 1245 leaving remainder 4 and 3

Q. 10 Two numbers are in the ratio 15: 11. If their HCF is 13 and LCM is 2145 then find the numbers

Q. 11 The LCM of two numbers is 14 times their HCF. The sum of HCF and LCM is 600. If one number is 280, find the other number.

Q. 12 Prove that $\sqrt{2} + \sqrt{5}$ is irrational

Q. 13 Prove that $5 - 2\sqrt{3}$ is an irrational number

Q. 14 Prove that $\sqrt{2}$ is irrational

Chapter-2

Q. 1 Find the zeroes of the polynomial $x^2 - 3$ and verify the relationship between the zeroes and the coefficients.

Q. 2 Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. (i) $6x^2 - 3 - 7x$ *(ii)* $4u^2 + 8u$

Q. 3 Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively

(i) $\sqrt{2}$, 1/3 (ii) 0, $\sqrt{5}$

Q. 4 If α and β are the zeroes of the polynomial $f(x) = x^2 - 8x + k$ such that $\alpha^2 + \beta^2 = 40$, find k

Q. 5 If the product of zeroes of the polynomial $ax^2 - 6x - 6$ is 4, find the value of a

Q. 6 If α, β are the zeroes of quadratic polynomial $2x^2 + 5x + k$, find the value of k such that

$(\alpha + \beta)^2 - \alpha\beta = 24$

Q. 7 If 1 is a zero of polynomial $ax^2 - 3(a-1) - 1$, then find the value of a

Q. 8 If α and β are zeroes of $x^2 + 5x + 5$, find the value of $\alpha^{-1} + \beta^{-1}$

Q. 9 α, β are the zeroes of the quadratic polynomial $x^2 - (k+6)x + 2(2k - 1)$. Find the value of k if $\alpha + \beta = \frac{1}{2}\alpha\beta$

Chapter-3

Q. 1 Aftab tells his daughter, "Seven years ago, I was seven times as old as you were then. Also, three years from now, I shall be three times as old as you will be." (Isn't this interesting?) Find the solution algebraically and graphically.

Q. 2 On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the given equations are consistent or inconsistent

(i) 3/2 x + 5/3 y=7 , 9x − 10y=14 (ii) $5x - 3y = 11$; $-10x + 6y = -22$

Q. 3 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.

Q. 4 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.

Q. 5 Solve the following pair of linear equations by the substitution method.

(i) $\sqrt{2}$ x + $\sqrt{3}$ y = 0 and $\sqrt{3}$ x - $\sqrt{8}$ y = 0

Q. 6   Form the pair of linear equations for the following problems and find their solution by substitution method.
(i) The larger of two supplementary angles exceeds the smaller by 18 degrees. Find them.
(ii) The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is Rs 105 and for a journey of 15 km, the charge paid is Rs 155. What are the fixed charges and the charge per km.
(iii) Five years hence, the age of Jacob will be three times that of his son. Five years ago, Jacob's age was seven times that of his son. What are their present ages?

Q. 7   The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. How many such numbers are there?

Q. 8   If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes ½ if we only add 1 to the denominator. What is the fraction?

Q. 9   Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu?

Q. 10   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

Q. 11   Meena went to a bank to withdraw Rs 2000. She asked the cashier to give her Rs 50 and Rs 100 notes only. Meena got 25 notes in all. Find how many notes of Rs 50 and Rs 100 she received.

Q. 12   A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid Rs 27 for a book kept for seven days, while Susy paid Rs 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.

Q. 13   For which values of p does the pair of equations given below has unique solution?
$$4x + py + 8 = 0 \qquad 2x + 2y + 2 = 0$$

Q. 14   The sum of the digits of a two digit number is 15. The number obtained by interchange the digit exceeds the given number by 9. Find the number

Q. 15   A women has 60 notes in all of Rs 10 and Rs 20 denomination. If the total worth of the notes is Rs 850, find out how many notes of each kind does she have.

Q. 16   In an examination one mark is awarded for each correct answer while ½ marks is deducted for every wrong answer. Jaya answered 120 questions and got 90 marks. How many questions did she answer correctly?

Q. 17   Find the value of unknown when equation has infinite many solutions. (i) x+(k+1)y =4 , (k+1)x +9y = 5k +2
(ii) (k-1) x −y =5 , (k+1)x + (1-k)y = 3k+1   (iii) 2x-y =5 , (p+q)x + (2q-p)y = 15

Q. 18   Find the value of unknown when equation has unique solution (i) 9x +py-1 =0, 3x+4y-2 =0
(ii) 2x-3y=1 , kx +5y=7

Chapter-15

Q. 1   A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is *double* that of a red ball, determine the number of blue balls in the bag.

Q. 2   A box contains 12 balls out of which x are black. If one ball is drawn at random from the box, what is the probability that it will be a black ball?
If 6 more black balls are put in the box, the probability of drawing a black ball is now double of what it was before. Find x.

Q. 3   A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is 2/3 . Find the number of blue balls In the jar.

Q. 4   A card is drawn at random from a pack of 52 playing cards. Find the probability that the card drawn is neither a black card not a king.

Q. 5   A bag contains cards which are numbered from 2 to 90. A card is drawn at random from the bag. Find the probability that it bears (i) a two digit number (ii) a number which is a perfect square.

Q. 6   Cards bearing numbers 1, 3, 5 ..... 35 are kept in a bag. A card is drawn at random from the bag. Find the probability of getting a card bearing (i) a prime no. less than 15 (ii) a no. divisible by 3 and 5.

Q. 7   Find the probability of getting 53 Fridays (i) in a leap year (ii) in a non-leap year.

Q. 8   From a pack of 52 playing cards , jacks, queens, kings and aces are removed, from the remaining , a card is drawn at random. Find the probability that the card drawn is
(i) a black queen   (ii) a red card   (iii) a black jack   (iv) a face card

Q. 9 Two dice are thrown together . what is the probability of the sum of the numbers on the two faces
(i) neither a multiple of 3 nor a multiple of 4   (ii) getting a number greater than 3 on each die
(iii) is a doublet of odd numbers   (iv) have a sum less than 7

Chapter-7

Q. 1 Show that the points (1, 7), (4, 2), (–1, –1) and (– 4, 4) are the vertices of a square.

Q. 2 Find a relation between x and y such that the point (x , y) is equidistant from the points (7, 1) and (3, 5).

Q. 3 Find a point on the y-axis which is equidistant from the points A(6, 5) and B(– 4, 3).

Q. 4 Find the point on the x-axis which is equidistant from (2, –5) and (–2, 9).

Q. 5 Find the values of y for which the distance between the points P(2, – 3) and Q(10, y) is 10 units.

Q. 6 If Q(0, 1) is equidistant from P(5, –3) and R(x, 6), find the values of x. Also find the distances QR and PR.

Q. 7 Find a relation between x and y such that the point (x, y) is equidistant from the point (3, 6) and (– 3, 4).

Q. 8 In what ratio does the point (– 4, 6) divide the line segment joining the points A(– 6, 10) and B(3, – 8)?

Q. 9 Find the coordinates of the points of trisection (i.e., points dividing in three equal parts) of the line segment joining the points A(2, – 2) and B(– 7, 4).

Q. 10 Find the ratio in which the y-axis divides the line segment joining the points (5, – 6) and (–1, – 4). Also find the point of intersection.

Q. 11 If the points A(6, 1), B(8, 2), C(9, 4) and D(p, 3) are the vertices of a parallelogram, taken in order, find the value of p.

Q. 12 Find the ratio in which the line segment joining the points (– 3, 10) and (6, – 8) is divided by (1, 6).

Q. 13 Find the ratio in which the line segment joining A(1, – 5) and B(– 4, 5) is divided by the x-axis. Also find the coordinates of the point of division.

Q. 14 If (1, 2), (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order, find x and y.

Q. 15 Find the coordinates of a point A, where AB is the diameter of a circle whose centre is (2, – 3) and B is (1, 4).

Q. 16 If A and B are (– 2, – 2) and (2, – 4), respectively, find the coordinates of P such that AP=3/7 AB and P lies on the line segment AB.

Q. 17 Find the value of k if the points A(2, 3), B(4, k) and C(6, –3) are collinear.

Q. 18 In each of the following find the value of 'k', for which the points are collinear.

  (i) (7, –2), (5, 1), (3, k)   (ii) (8, 1), (k, – 4), (2, –5)

Q. 19 Find a relation between x and y if the points (x, y), (1, 2) and (7, 0) are collinear.

Q. 20 Determine the ratio in which the line $2x + y – 4 = 0$ divides the line segment joining the points A(2, – 2) and B(3, 7).

Q. 21 Find the centroid of the triangle , whose vertices are (1,-1), (-4,6) and (-4,4)

ACTIVITIES:
1. HCF of two numbers
2. Quadratic Polynomial
3. System of Linear Equations
4. Probability