

**SECTION - A**

◆ **Answer the questions as indicated in instruction : (Question no. 1-24) (Each carries 1 mark) [24]**

◆ **Following question are multiple choice question : (Question no. 1-6) (Each carries 1 mark)**

1. If the graph of  $y = mx + 3$  passes through point  $(2, 11)$ , then  $m = \dots\dots$   
A. 4                      B. -4                      C.  $\frac{1}{4}$                       D.  $-\frac{1}{4}$
2. If the equation  $2x^2 - kx + k = 0$  has equal roots, then  $k = \dots\dots$   
A. 0                      B. 4                      C. 8                      D. 0 or 8
3.  $2k + 1, 13, 5k - 3$  are consecutive terms of an AP then find  $k$ .  
(A) 17                      (B) 13                      (C) 4                      (D) 9
4. The distance of  $M(x, y)$  from the origin  $O(0, 0)$  is  $\dots\dots$ .  
(A)  $x^2 + y^2$                       (B)  $\sqrt{x^2 + y^2}$                       (C)  $\sqrt{x^2 - y^2}$                       (D)  $|x - y|$
5. The discriminant  $3x^2 - 6x + 2 = 0$  is  $\dots\dots$   
A. -12                      B. 12                      C. -60                      D. 60
6. If  $a_3 = 8$  and  $a_7 = 24$  then find  $a_{10}$ .  
(A) -4                      (B) 28                      (C) 32                      (D) 36

◆ **Fill in the blanks with appropriate answers : (Question no. 7-12) (Each carries 1 mark)**

7. HCF of the smallest prime number and the smallest composite number is  $\dots\dots$  (12, 4, 2)
8. The nature of roots of the quadratic equation  $4x^2 - 49 = 0$  are  $\dots\dots$
9.  $a = pq^2$  and  $b = p^3q$  where  $p$  and  $q$  are prime numbers then  $\text{LCM}(a, b) = \dots\dots$  ( $p^2q^3, p^3q^2, p^2q^2$ )
10. The sum of a number and its reciprocal is  $\frac{17}{4}$ . The quadratic equation in standard form with integer coefficients is  $\dots\dots$
11. If  $\text{HCF}(12, 40) = 40 + 4X$ , then  $X = \dots\dots$  (-9, 9, 6)
12. If the equation  $x^2 + kx + 25 = 0$  has equal roots, then  $k = \dots\dots$

◆ **State whether the following statements are true or false : (Question no. 13-18) (Each carries 1 mark)**

13.  $\pi$  is an irrational number
14. 2 is one of the zero of polynomial  $p(x) = x^2 - 6x + 8$ .
15. Quadratic equation  $2x^2 - 4x + 3 = 0$  has no real roots.
16. The sum of two rational number is always rational.
17. If the graph of polynomial intersects X-axis at only one point then polynomial can't be quadratic polynomial.
18. A quadratic equation has at least two real roots.

◆ **Answer the questions in one sentence : (Question no. 19-24) (Each carries 1 mark)**

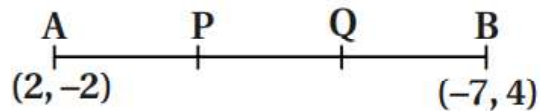
19. Find HCF of 6 & 14.
20. Write distance formula between two points  $A(x_1, y_1)$  &  $B(x_2, y_2)$ .
21. Find mid point of  $A(2, 9)$  &  $B(6, -1)$ .

22. Find the common difference 'd' for an AP  $-2, -6, -10, -14, \dots$
23. Name the type of the progression  $-1.0, -1.5, -2.0, -2.5, \dots$ ?
24. Find 31<sup>st</sup> term of an AP  $101, 96, 91, \dots$

### SECTION - B

◆ Answer any 9 questions out of 13 questions (Question no. 25-37) (Each carries 2 mark) [18]

25. Prove that  $3 + 2\sqrt{5}$  is irrational.
26. Find the roots by factorisation :  $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$
27. Find the sum of first 20 multiples of 7.
28. Find a quadratic polynomial whose sum and product of zeroes are respectively  $-\frac{1}{4}$  and  $\frac{1}{4}$ .
29. Find the roots of the following quadratic equations by factorisation :  $2x^2 + x - 6 = 0$
30. How many two-digit numbers are divisible by 3 ?
31. How many two-digit numbers are divisible by 3 ?
32. 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).



33. Find the point on the X-axis which is equidistant from (2, -5) and (-2, 9).
34. In  $\Delta ABC$ , right-angled at B,  $AB = 24$  cm,  $BC = 7$  cm. Determine : (i)  $\sin A$ ,  $\cos A$  (ii)  $\sin C$ ,  $\cos C$
35. The length of the minute hand of a clock is 17.5 cm. Find the area of the region swept by it in 15 minutes time duration.
36. Find the area of the minor segment of a circle of radius 14 cm, when the angle of the corresponding sector is  $60^\circ$ .
37. Find the area of a sector of a circle of radius 28 cm and central angle  $45^\circ$ .

### SECTION - C

◆ Answer any 6 questions out of 9 questions (Question no. 38-46) (Each carries 3 mark) [18]

38. Solve the following pair of linear equations by the Elimination Method

$$x + y = 5 \dots(i)$$

$$2x - 3y = 4 \dots(ii)$$

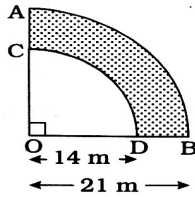
39. Find the sum :  $(-5) + (-8) + (-11) + \dots + (-230)$
40. Verify that (5, -2), (6, 4) and (7, -2) are vertices of a isosceles triangle.
41. Solve the given pair of equations by Elimination Method :

$$s - t = 3 \dots(i)$$

$$\frac{s}{3} + \frac{t}{2} = 6 \dots(ii)$$

42. 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.

43. 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'.
44. Find a relation between x and y such that the point (x, y) is equidistant from the point (3, 6) and (-3, 4).
45. Find the sum of the following AP:  $\frac{1}{15}, \frac{1}{12}, \frac{1}{10}, \dots$  upto 11 terms.
46. In the given diagram, the A shaded portion represents a flowerbed in a plot. If  $\angle O=90^\circ$ , OB = 21 m and OD = 14 m, find the area of the flowerbed.



### SECTION - D

◆ Answer any 5 questions out of 8 questions (Question no. 47-54) (Each carries 4 mark) [20]

47. Is the following situation possible? The sum of the age of two friends is 15 years. Four years ago, the product of their ages in year was 36 years. If yes, then find the age of both friends.
48. In a school, students thought of planting trees in and around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be twice the class in which they are studying e.g. a section of class I will plant 2 trees, a section of class II will plant 4 trees and so on till class XII. There are three section of each class. How many trees will be planted by the students?
49. In a potato race, a bucket is placed at the starting point, which is 5m from the first potato and the other potatoes are placed 3 m apart in a straight line. There are 15 potatoes in the line. A competitor starts from the bucket picks up the nearest potato, runs back with it, drop it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in and continues in the same way until all the potatoes are in the bucket what is the total distance the competitor has to run? If the distance run by competitor is 1340 m then find the number of potatoes.
50. Without finding the zeroes  $\alpha$  and  $\beta$  of polynomial  $p(x) = 3x^2 - 10x + 7$ , find the values of the following:
- A.  $\frac{1}{\alpha} + \frac{1}{\beta}$                       B.  $\alpha^2 + \beta^2$                       C.  $\alpha^3 + \beta^3$
51. Ten years ago, the age of a father was 12 times the age of his son then. Ten years hence, the age of the father will be twice the age of the son then. Find the present ages of both of them.
52. The ratio of two numbers is 5: 6. If both the numbers are decreased by 8, the ratio of new numbers is 4:5. Find those numbers.
53. (-1, 3), (1, -1) and (5, 1) are the vertices of a triangle. Find the length of the median through the vertex (-1, 3).
54. The product of the digits of a two-digit number is 18. The number obtained by interchanging the places of the digits is 63 less than the original number. Find the original number.