

General Instructions:

1. All questions are compulsory.
2. Question paper is divided into four sections: Section A contains 4 questions each carry 1 mark, Section B contains 4 questions each carry 2 marks, Section C contains 4 questions each carry 3 marks and Section D contains 4 questions each carry 4 marks.

SECTION – A(1 marks each)

1. For what values of k will the following pair of linear equations have infinitely many solutions?
 $kx + 3y - (k - 3) = 0$ and $12x + ky - k = 0$
2. State Euclid's Division Lemma.
3. If $(k, 3)$ is a solution of the equation $3x + 2y - 22 = 0$, then find the value of k .
4. Find a quadratic polynomial, the sum and product of whose zeroes are -7 and 9 respectively.

SECTION – B(2 marks each)

5. Show that the number 4^n , where n is a natural number, cannot end with 0.
6. There is a circular path around a sports field. Sonia takes 18 minutes to run one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point? How is running is useful for good health?
7. Solve for x and y : $2x + 3y = 8$ and $4x + 6y = 7$
8. Manoj helped his friend by giving Rs. 5 to him to purchase pen and Aditya helped a poor child by giving Rs. 7 to purchase food. Find a quadratic polynomial, the sum and product of whose zeroes are 5 and 7 respectively. Which values depicted from this?

SECTION – C(3 marks each)

9. Find the zeroes of the quadratic polynomial $3x^2 - x - 4$ and verify the relationship between the zeroes and the coefficients.
10. Solve: $px + qy = p - q$ and $qx - py = p + q$
11. Divide $3x^2 - x^3 - 3x + 5$ by $x - 1 - x^2$, and verify the division algorithm.
12. Prove that $7 - 2\sqrt{3}$ is an irrational number.

SECTION – D(4 marks each)

13. 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.
 14. The ratio of incomes of two persons is $9 : 7$ and the ratio of their expenditures is $4 : 3$. If each of them manages to save Rs 2000 per month, find their monthly incomes. Mention any three way of savings from the income.
 15. Obtain all the zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$.
 16. Show that any positive odd integer is of the form $6q + 1$ or $6q + 3$ or $6q + 5$ where $q \in \mathbb{Z}$.
-