MATHEMATICS MOCK TEST

Class: IX | Set: 1

Time: 1 Hour 30 Minutes | Written Marks: 35 | Viva: 5 | Total: 40 Marks

NAME: _____ **ROLL NO:** _____

SECTION A

(1 Mark Each)

1. Find the degree of the polynomial $p(x) = 4x^4 - 3x^2 + 2x^7 - 5$.
2. If $(2, 0)$ is a solution of the linear equation $2x + 3y = k$, find the value of k.
3. In which quadrant does the point $(-3, -5)$ lie?
4. Simplify the expression: $(3 + \sqrt{3})(3 - \sqrt{3})$.
5. State the Remainder Theorem for a polynomial $p(x)$ when divided by $(x - a)$.

SECTION B

(2 Marks Each)

6. Rationalize the denominator: $\frac{1}{\sqrt{7}-\sqrt{6}}$.
7. If $x = -1, y = 2$ is a solution of the equation $3x + 4y = k$, find the value of k.
8. Expand using a suitable identity: $(2x - y + z)^2$.
9. Factorize the expression by grouping: $x^3 + x - 3x^2 - 3$.
10. Evaluate $(102)^3$ using a suitable algebraic identity.

SECTION C

(3 Marks Each)

11. Find the values of a and b if:
$$\frac{\sqrt{3} - 1}{\sqrt{3} + 1} = a - b\sqrt{3}$$
12. Factorize the polynomial $x^3 - 23x^2 + 142x - 120$ using the Factor Theorem.
13. Three vertices of a rectangle are $A(0, 4), B(0, 0)$, and $C(3, 0)$. Plot these points and determine the coordinates of the fourth vertex D.
14. If $x + \frac{1}{x} = 4$, find the value of $x^2 + \frac{1}{x^2}$ and $x^4 + \frac{1}{x^4}$.

SECTION D

(4 Marks Each)

15. If $x = 2 + \sqrt{3}$, find the exact value of $x^3 + \frac{1}{x^3}$.

16. The polynomial $p(x) = x^4 - 2x^3 + 3x^2 - ax + b$ leaves remainders 5 and 19 when divided by $(x - 1)$ and $(x + 1)$ respectively. Find the values of a and b.

VIVA VOCE

(5 Marks)

- **Logic Check:** Can a linear equation in two variables have only one solution? Why?
- **Definition:** What is the difference between a rational number and an irrational number?
- **Identity:** Recite the expansion for $a^3 + b^3 + c^3 - 3abc$.
- **Coordinates:** On which axis does the point $(0, -5)$ lie?
- **Theorems:** If $p(a) = 0$, what conclusion can you draw about $(x - a)$?