MATHEMATICS MOCK TEST

Class: IX | Set: 5

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

NAME: _____ **ROLL NO:** _____

SECTION A

(1 Mark Each)

1. Write the coefficient of x^2 in the polynomial $p(x) = \frac{\pi}{6}x + x^2 - 1$.
2. Find the value of $(32)^{1/5}$.
3. In which quadrant does the point $(4, -2)$ lie?
4. Write one possible solution for the linear equation $x + \pi y = 4$.
5. What is the degree of a non-zero constant polynomial?

SECTION B

(2 Marks Each)

6. Evaluate the product $(103) \times (97)$ using a suitable algebraic identity.
7. Find the value of a if $x = -\frac{1}{2}$ is a zero of the polynomial $p(x) = 8x^3 - ax^2 - x + 2$.
8. Simplify the expression: $\sqrt[4]{1250} \div \sqrt[4]{2}$.
9. Factorize: $x^2 + y - xy - x$.
10. If the point $(2k - 3, k + 2)$ lies on the graph of the equation $2x + 3y + 15 = 0$, find the value of k.

SECTION C

(3 Marks Each)

11. If $x = 3 + \sqrt{8}$, find the value of $x^2 + \frac{1}{x^2}$.
12. Factorize $x^3 - 10x^2 - 53x - 42$ completely using the Factor Theorem.
13. Plot the points $P(1, 0), Q(4, 0),$ and $S(1, 3)$ on a graph paper. Find the coordinates of the point R such that $PQRS$ is a square.
14. Prove that:

$$\left(\frac{x^a}{x^b}\right)^c \times \left(\frac{x^b}{x^c}\right)^a \times \left(\frac{x^c}{x^a}\right)^b = 1$$

SECTION D

(4 Marks Each)

15. If $a + b + c = 9$ and $a^2 + b^2 + c^2 = 35$, find the value of $a^3 + b^3 + c^3 - 3abc$.

16. The cost of a notebook is twice the cost of a pen. Write a linear equation in two variables to represent this statement and draw its graph.

VIVA VOCE

(5 Marks)

- **Definitions:** Can you define a 'Biquadratic' polynomial?
- **Logic:** If a point lies on the x-axis, what is always the value of its ordinate?
- **Identities:** What is the result of $(a + b + c)^2$ if the sum of squares of individual terms is zero?
- **Exponents:** Is it possible for $a^x = a^y$ but $x \neq y$? (Hint: Consider $a = 1$).
- **Polynomials:** Explain the difference between a 'zero of a polynomial' and the 'zero polynomial'.