> **Following short questions are selected from previous 5 years papers of different boards. Solve these at your own to perform well in annual exams.**

1. Define a quadratic equation.

2. Define a polynomial function and degree of a polynomial.

3. Define a reciprocal equation and give an example.

4. Define a radical equation and give an example.

5. Solve the equation: $x(x + 7) = (2x - 1)(x + 4)$ by factorization.

6. The sum of a positive number and its square is 380. Find the number.

7. Reduce $x^{-2} - 10 = 3x^{-1}$ to quadratic form.

8. When polynomial $x^3 + 2x^2 + kx + 4$ is divided by $x - 2$, the remainder is 14. Find the value of k.

9. Use factor theorem to determine that $x + a$ is a factor of $x^n + a^n$, where n is an odd integer.

10. Show that $x - 2$ is a factor of $x^4 - 13x^2 + 36$.

11. When $x^4 + 2x^3 + kx^2 + 3$ is divided by $x - 2$, the remainder is 1. Find the value of k.

12. By remainder theorem find remainder when $x^2 + 3x + 7$ is divided by $x + 1$.

13. Show that $x - 1$ is a factor of $x^2 + 4x - 5$.

14. If α, β are roots of $5x^2 - x - 2 = 0$, form an equation whose roots are $\frac{3}{\alpha}$ and $\frac{3}{\beta}$.

15. Evaluate $(1 + \omega - \omega^2)^8 (1 - \omega + \omega^2)$.

16. Prove that $(-1 + \sqrt{-3})^4 + (-1 - \sqrt{-3})^4 = -16$.

17. Show that $x^3 - y^3 = (x - y)(x - \omega y)(x - \omega^2 y)$.

18. Show that $1 + \omega^{37} + \omega^{38} = 0$.

19. If α, β are the roots of $x^2 - px - p - c = 0$, then prove that $(1 + \alpha)(1 + \beta) = 1 - c$.

20. If α, β are the roots of $3x^2 - 2x + 4 = 0$, then find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$.

21. If α, β are the roots of $3x^2 - 2x + 4 = 0$. Find the value of $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$.

22. Discuss the nature of the roots of $x^2 + 2x + 3 = 0$.

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23. Discuss the nature of the roots of $4x^2 + 6x + 1 = 0$.

24. Discuss the nature of the roots of $x^2 - 5x + 6 = 0$.

25. Show that the roots of $px^2 - (p - q)x - q = 0$ are rational.

26. For what value(s) of m, will the roots of the equation $(m + 1)x^2 + 2(m + 3)x + m + 8 = 0$ be equal?

Best of Luck