Very Short Answer Questions

1. Which constant should be added and subtracted to solve the quadratic equations $5x^2 - \sqrt{2}x + 3 = 0$ by the method of completing the square?

2. What is the value of k for which 3 is a root of the equation $kx^2 - 7x + 3 = 0$?

3. If the equation $16x^2 + 6kx + 4 = 0$ has equal roots, then what is the value of k?

4. If $ax^2 + bx + c = 0$ has equal roots, then what is b equal to?

5. What can be said about the quadratic equation $x^2 - 5x + 3 = 0$?

6. What are the roots of the equation $x^2 - 9x + 20 = 0$?

7. What is the value (s) of k for which the equation $kx^2 - kx + 1 = 0$ has equal roots?

8. If the roots of the equation $(a^2 + b^2)x^2 - 2b(a + c)x + (b^2 + c^2) = 0$ are equal, then $b^2 = ?$

9. What is the discriminant of the quadratic equation $3\sqrt{3}x^2 + 10x + \sqrt{3} = 0$?

10. Write a quadratic equation which has the product of two roots is 5.

Short Answer Questions–I

11. For what value of k, -2 is a root of the equation $3x^2 + 4x + 2k = 0$?

12. What is the nature of roots of the quadratic equation $4x^2 - 12x - 9 = 0$?

13. Write the discriminant of the quadratic equation $\frac{1}{2}x^2 - 3x + 5 = 0$.

14. Find the value of p so that the quadratic equation $px(x - 3) + 9 = 0$ has equal roots.

15. Find the discriminant of the quadratic equation: $4x^2 - \frac{2}{3}x - \frac{1}{16} = 0$

State whether the following quadratic equations have two distinct real roots or not. Justify your answer. (Q. 16 to 19)

16. $2x^2 + x - 1 = 0$

17. $(x + 4)^2 - 8x = 0$

18. $(x - \sqrt{2})^2 - 2(x + 1) = 0$

19. $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + \frac{1}{\sqrt{2}} = 0$

20. Does a quadratic equation with integral coefficient has integral roots? Justify your answer.

21. Is 0.2 a root of the equation $x^2 - 0.4 = 0$? Justify.

22. If the coefficient of x^2 and the constant term have the same sign and if the coefficient of x term is zero, then the quadratic equation has no real roots. State true or false and justify your answer.

23. For what value of k does the equation $x^2 + 2x + (k^2 + 1) = 0$ has real and equal roots?

24. Find the value(s) of k for which the quadratic equation $(k + 4)x^2 + (k + 1)x + 1 = 0$ has equal roots.

25. Find the value of k for which the quadratic equation $k^2x^2 - 2(2k - 1)x + 4 = 0$ has real and equal roots.

26. Write the condition to be satisfied for which equation $ax^2 + 2bx + c = 0$ and $bx^2 - 2\sqrt{ac}x + b = 0$ have equal roots.

27. If equation $ax^2 + bx + c = 0$ has equal roots, then find 'c' in terms of 'a' and 'b'.

Short Answer Questions–II

Find the roots of the following quadratic equations using the quadratic formula (Q. 28 to 31):

28. $-3x^2 + 5x + 12 = 0$

29. $x^2 - 3\sqrt{5}x + 10 = 0$

30. $\frac{1}{2}x^2 - \sqrt{11}x + 1 = 0$

31. $6a^2x^2 - 7abx - 3b^2 = 0,\ a \neq 0$