Chapter- 4

Chapter Name: QUADRATIC EQUATIONS

QUESTION BANK

OBJECTIVE TYPE QUESTIONS
Based on NCERT Book

I. Multiple Choice Questions

Each of the following questions has 4 alternatives, out of which only one is correct. Point out the correct alternative.

1. If $x = k$ be a solution of the quadratic equation $x^2 + 4x + 3 = 0$, then $k =$
   (a) 2
   (b) -3
   (c) 3
   (d) -2

2. If $x = k\sqrt{2}$ be a solution of the quadratic $x^2 + \sqrt{2}x - 4 = 0$, then $k =$
   (a) -1
   (b) -2
   (c) 2
   (d) 4

3. The positive real root of the equation $64x^2 - 1 = 0$ is
   (a) 8
   (b) $\frac{1}{16}$
   (c) $\frac{1}{8}$
   (d) $\frac{1}{4}$

4. The non-zero root of the equation $3z - 5z^2 = 0$ is
   (a) $\frac{3}{5}$
   (b) $\frac{5}{3}$
   (c) $\frac{5}{9}$
   (d) $\frac{9}{5}$

5. The non-negative real root of the quadratic equation $3x^2 - 5x - 2 = 0$ is
   (a) 3
   (b) $\frac{1}{3}$
   (c) 2
   (d) $\frac{1}{2}$

6. The discriminant of the quadratic equation $3x^2 - 4x - 2 = 0$ is equal to
   (a) 40
   (b) 20
   (c) 24
   (d) 48

7. The discriminant of the quadratic equation $ax^2 - 4ax + 2a + 1 = 0$ is
   (a) $4a(2a + 1)$
   (b) $2a(2a + 1)$
   (c) $4a(2a - 1)$
   (d) $2a(4a - 1)$

8. The quadratic equation $ax^2 - 4ax + 2a + 1 = 0$ has repeated root if $a =$
   (a) 0
   (b) $\frac{1}{2}$
   (c) 2
   (d) 4

9. The quadratic $px^2 + 4x + 1 = 0, p > 0$ has a repeated root if $p =$
   (a) 4
   (b) 2
   (c) 1
   (d) $\frac{1}{2}$

10. The quadratic equation $px^2 + 4x + 1 = 0, p > 0$ has real roots if $p =$
    (a) 5
    (b) 6
    (c) 8
    (d) 3

11. The value of k for which the equation $9x^2 + 8kx + 8 = 0$ has equal roots is
    (a) only 3
    (b) only -3
    (c) ± 3
    (d) None of these

12. Which of the following is not reducible to a quadratic equation ?
    (a) $x - \frac{3}{x} = 3$
    (b) $3x - \frac{5}{x} = x^2$
    (c) $x + \frac{1}{x} = 3$
    (d) $x^2 - 3 = 4x^2 - 4x$

13. If $x^2 - 5x + 1 = 0$, then the value of $x + \frac{1}{x}$ is
    (a) 5
    (b) -5
    (c) -2
    (d) 3

14. The quadratic $kx^2 - 2kx + 2 = 0$ has equal roots if $k =$
    (a) 0
    (b) 2
    (c) 1
    (d) 4

15. Which of the following equations has 2 as a root ?
    (a) $x^2 - 4x + 5 = 0$
    (b) $x^2 + 3x - 12 = 0$
    (c) $2x^2 - 7x + 6 = 0$
    (d) $3x^2 - 6x - 2 = 0$

16. Which of the following equations has the sum of its roots as 3 ?
    (a) $2x^2 - 3x + 6 = 0$
    (b) $-x^2 + 3x - 3 = 0$
    (c) $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0$
    (d) $3x^2 - 3x + 3 = 0$

17. Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is
    (a) 0 only
    (b) 4
    (c) 8 only
    (d) 0, 8

18. If $px^2 + 3x + q = 0$ has two roots -1 and -2, then the value of $q - p$ is
    (a) -1
    (b) 2
    (c) -2
    (d) 1

1. Show that $x = -3$ is a solution of equation $x^2 + 6x + 9 = 0$.
2. Find the discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$.
3. Find quadratic equation, if p and q are the roots of the equation $x^2 - px + q = 0$ when $p = 1$ and $q = -2$.
4. For what value of k does the quadratic equation $(k - 5)x^2 + 2(k - 5)x + 2 = 0$ have equal roots?   [Foreign 2011]
5. Solve for x: $36x^2 - 12ax + (a^2 - b^2) = 0$.
6. Determine the value of k for which the quadratic equation $kx^2 - 5x + k = 0$ has equal roots.
7. Find the values of h and k for which $x = -2$ and $x = 3/4$ are solution of the equation $hx^2 + kx - 6 = 0$.
8. Determine the set of values of p for which the given quadratic equation has real roots:
    (i) $4x^2 + 8x - p = 0$ (ii) $4x^2 - 3px + 9 = 0$.
9. A train covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hour more, it would have taken 30 minutes less for the journey. Find the original speed of the train.
10. The difference of squares of two natural numbers is 45. The square of the smaller number is four times the larger number. Find the numbers.
11. A two digit number is 4 times the sum of its digits and twice the product of its digits. Find the number.
12. An aeroplane takes one hour less for a journey of 1200 km if its speed is increased by 100 km/hour from its usual speed. Find its usual speed.
13. A two-digit number is 5 times the sum of its digits and is also equal to 5 more than twice the product of its digits. Find the number.
14. The sum of the squares of two natural numbers is 34. If the first number is one less than twice the second number, find the numbers.
15. Aeroplane left 30 minutes later than its scheduled time and in order to reach distination 1500 km away in time, it has to increase its speed by 250 km/h from its usual speed. Determine its usual speed.
16. Divide 29 into two parts so that the sum of the squares of the parts is 425.
17. A person on tour has ₹ 360 for his daily expenses. If he exceeds his tour programme by 4 days, he must cut down his daily expenses by ₹ 3 per day. Find the number of days of his tour programme.
18. An express train makes a run of 240 km at a certain speed. Another train whose speed is 12 km/hr less takes an hour longer to cover the same distance. Find the speed of the express train in km/hr.
19. The side of a square exceeds the side of another square by 4 cm and the sum of the areas of the two squares is 400 sq. cm. Find the dimensions of the squares.
20. The denominator of a fraction exceeds its numerator by 3. If one is added to both numerator and denominator, the difference between the new and the original fractions is 1/24. Find the original fraction.