# UNIT 04: QUADRATIC EQUATIONS

## I. Multiple Choice Questions:

**Choose the correct answer from the given four options in the following questions:**

1. The common root of the equations $x^2 - 7x + 10 = 0$ and $x^2 - 10x + 16 = 0$ is
   (a) 3 (b) 5 (c) 2 (d) -2
2. The roots of the equation $x^2 + 2x - 35 = 0$ are
   (a) 5, 7 (b)-5,-7 (c)-5, 7 (d) 5,-7
3. The equation $x^2 + 4x + k = 0$ has real roots, when
   (a) $k \geq 4$ (b) $k \geq 0$ (c) $k \leq 0$ (d) $k \leq 4$
4. If the perimeter of a rectangle is 82 m and its area is 400 sq m, the breadth of the rectangle is
   (a) 25 m (b) 16 m (c) 16 m (d) 20 m
5. Values of k for which $2x^2 - kx + k = 0$ has equal roots is
   (a) 0 only (b) 4 (c) 8 only (d) 0, 8

## II. Fill in the blanks:

**Complete the following sentences:**

1. The expression $b^2 - 4ac$ is called the …….
2. The quadratic equation $ax^2 + bx + c = 0$ has no real roots if ……
3. If a real number k satisfies $ax^2 + bx + c = 0$, then k is called a ……
4. The graphical representation of $ax^2 + bx + c = 0$ is a …….
5. In $ax^2 + bx + c = 0$, the real number 'a' is always ……..

## III. Subjective Questions:

1. A natural number when increased by 12 equals 160 times its reciprocal. Find the number.
2. Solve $3a^2x^2 + 8abx + 4b^2 = 0$ using factorization.
3. Determine the value of p for which the quadratic equation $px^2 + (p-1)x + (p-1) = 0$ have a repeated root?
4. If -4 is a root of the quadratic equation $x^2 + px - 4 = 0$ and the quadratic equation $x^2 + px + k = 0$ has equal roots , find the value of k.
5. A passenger train takes 2 hours less for a journey of 300 Km if its speed is increased by 5 km/h from its usual speed .Find its usual speed.

## IV. HOTS Questions:

1. If the equation $(1 + m^2)x^2 + 2mcx + c^2 - a^2 = 0$ has equal roots, show that $c^2 = a^2(1 + m^2)$.
2. A piece of cloth costs Rs 35.If the piece were 4m longer and each metre costs Re 1 less, the cost would remain unchanged. How long is the piece?

## V. Project work:

Prepare a project on the contribution of Babylonians in the study of quadratic equations.