1. If $\alpha,\ \beta$ are the roots of $x^2 - x + 1 = 0$ then the quadratic equation whose roots are $\alpha^{2015},\ \beta^{2015}$ is

(1) $x^2 - x + 1 = 0$
(2) $x^2 + x + 1 = 0$
(3) $x^2 + x - 1 = 0$
(4) $x^2 - x - 1 = 0$

2. For a quadratic $(a^2 - 3a + 2)x^2 + (a^2 - 5a + 6)x + a^2 - 4 = 0$, the number of values of a for which the given quadratic equation is an identity in x, is equal to

(1) 0
(2) 1
(3) 2
(4) 3

3. Difference between the corresponding roots of $x^2 + ax + b = 0$ and $x^2 + bx + a = 0$ is same and $a \neq b$, then

(1) a + b - 4 =0
(2) a - b - 4 = 0
(3) a - b + 4 = 0
(4) a + b + 4 = 0

4. Find the value of λ such that sum of the squares of the roots of $x^2 + (4 - \lambda)x + 3 = \lambda$ has the least value.

5. If one root of equation $x^2 + ax + 12 = 0$ is 4 while the equation $x^2 + ax + b = 0$ has equal roots, then the value of b is

(1) $\frac{4}{49}$
(2) $\frac{49}{4}$
(3) $\frac{7}{4}$
(4) $\frac{4}{7}$

6. The number of integral values of m for which the equation $(1 + m^2)x^2 - 2(1 + 3m)x + (1 + 8m) = 0$ has no real root is:

(1) 2
(2) 3
(3) Infinitely many
(4) 1

7. The number of all possible positive integral values of α for which the roots of the quadratic equation, $6x^2 - 11x + \alpha = 0$ are rational numbers is

(1) 3
(2) 4
(3) 5
(4) 2

8. The sum of the roots of the equation, $x^2 + |2x - 3| - 4 = 0$, is

(1) 2
(2) $-\sqrt{2}$
(3) $\sqrt{2}$
(4) -2

9. If $\alpha \neq \beta$, $\alpha^2 = 5\alpha - 3$ and $\beta^2 = 5\beta - 3$ then the equation whose roots are $\alpha/\beta,\ \beta/\alpha$ is

(1) $3x^2 - 25x + 3 = 0$
(2) $x^2 + 5x - 3 = 0$
(3) $x^2 - 5x + 3 = 0$
(4) $3x^2 - 19x + 3 = 0$

10. Let α & β be the roots of , $x^2 - 6x - 2 = 0$with $\alpha > \beta$. If $a_n = \alpha^n - \beta^n$ for $n \geq 1$, then the value of $\frac{a_{10} - 2a_8}{2a_9}$ is

(1) 1
(2) 2
(3) 4
(4) 3