Q1. If quadratic equation $a|x|^2 - 2|x| + 4 = 0$ has four distinct real roots then

(a) $a \in (-\infty, 0)$ (b) $a \in \left(0, \frac{1}{4}\right)$

(c) $a \in \left(0, \frac{1}{4}\right]$ (d) $a \in \left(-\infty, \frac{1}{4}\right)$

Q2. The number of real roots of equation $(x-1)^2 + (x-2)^2 + (x-3)^2 = 0$ is

(a) 2 (b) 1

(c) 0 (d) 3

Q3. If both roots of the quadratic equation $ax^2 + bx + c = 0$ (where, $a > 0$) are positive then

(a) $b < 0, c < 0$ (b) $b < 0, c > 0$

(c) $b > 0, c > 0$ (d) $b > 0, c < 0$

Q4. If one root of the equation $ax^2 + bx + c = 0,\ a \neq 0$, be reciprocal of the other, then

(a) b = c (b) a = c

(c) a = 0 (d) b = 0

Q5. If the equation $x^2 + ax + b = 0$ and $x^2 + bx + a = 0$, have a common root, then numerical value of $a + b$ is

(a) 1 (b) 0

(c) -1 (d) none of these

Q6. If a,b,c are positive real numbers, then the roots of the equation $ax^2 + bx + c = 0$ are

(a) real (b) imaginary

(c) real and equal (d) none of these

Q7. The number of real solutions of the equation $\sin\left(e^x\right) = 5^x + 5^{-x}$ is

(a) 0 (b) 1

(c) 2 (d) infinitely many

Q8. If $a < b < c < d$, then the equation $3(x-a)(x-c) + 5(x-b)(x-d) = 0$ has

(a) real and distinct root (b) real and equal roots

(c) purely imaginary roots (d) none of these

Q9. If α, β are the roots of the quadratic equation $ax^2 + bx + c = 0$, then the quadratic equation whose roots are α^3, β^3 is

(a) $a^3y^2 + (b^3 - 3abc)y + c^3 = 0$ (b) $a^3y^2 + (3abc - b^3)y - c^3 = 0$

(c) $a^2y^2 + 2aby + c^2 = 0$ (d) none of these

Q10. The number of real solutions of the equation $27^{1/x} + 12^{1/x} = 2\left(8^{1/x}\right)$ is

(a) 1 (b) 2

(c) 3 (d) none of these