QUADRATIC MOCK 1

1. If $(1 - p)$ is a root of quadratic equation $x^2 + px + (1 - p) = 0$ then its roots are-
(A) 0, 1 (B) – 1, 1 (C) 0, –1 (D) – 1, 2

2. If x is a solution of the equation,
$\sqrt{2x+1} - \sqrt{2x-1} = 1, \left(x \geq \frac{1}{2}\right)$,
then $\sqrt{4x^2-1}$ is equal to :
(A) $\frac{1}{2}$ (B) 2 (C) $2\sqrt{2}$ (D) $\frac{3}{4}$

3. The equation $\sqrt{3x^2+x+5} = x - 3$, where x is real, has :
(A) No solution
(B) Exactly one solution
(C) Exactly two solution
(D) Exactly four solution

4. The roots of the equation $(a^2 + b^2)\, x^2 - 2(bc + ad)\, x + (c^2 + d^2) = 0$ are equal, if -
(A) ab = cd (B) ac = bd
(C) ad + bc = 0 (D) None of these

5. Roots of the equation $(a + b - c)x^2 - 2ax + (a - b + c) = 0$, $(a, b, c \in Q)$ are –
(A) rational (B) irrational
(C) complex (D) none of these

6. If the roots of the equation $ax^2 + x + b = 0$ be real, then the roots of the equation $x^2 - 4\sqrt{ab}\, x + 1 = 0$ will be -
(A) Rational (B) Irrational
(C) Real (D) Imaginary

7. If roots α and β of the equation $x^2 + px + q = 0$ are such that $3\alpha + 4\beta = 7$ and $5\alpha - \beta = 4$, then (p, q) is equal to -
(A) (1, 1) (B) (– 1, 1)
(C) (– 2, 1) (D) (2, 1)

8. If one root of the equation $x^2 - 30x + p = 0$ is square of the other, then p is equal to-
(A) 125, 216 (B) 125, – 216
(C) Only 125 (D) Only – 216

9. If the equation $\frac{a}{x-a} + \frac{b}{x-b} = 1$ has roots equal in magnitude but opposite in sign, then the value of a + b is -
(A) – 1 (B) 0
(C) 1 (D) None of these

10. If the difference between the roots of the equation $x^2 + ax + 1 = 0$ is less than $\sqrt{5}$, then the set of possible values of a is-
(A) (–3, 3) (B) (–3, ∞)
(C) (3, ∞) (D) ($-\infty$, – 3)

11. If α and β are the roots of the equation $x^2 - x + 1 = 0$, then $\alpha^{2009} + \beta^{2009} =$
(A) – 2 (B) – 1 (C) 1 (D) 2

12. Let α and β be the roots of equation $px^2 + qx + r = 0$, $p \neq 0$. If p, q, r are in A.P. and $\frac{1}{\alpha} + \frac{1}{\beta} = 4$, then the value of $|\alpha - \beta|$ is -

13. If roots of quadratic equation $ax^2 + bx + c = 0$ are α and β then symmetric expression of its roots is -

(A) $\frac{\alpha}{\beta}+\frac{\beta^2}{\alpha}$ (B) $\alpha^2\beta^{-2}+\alpha^{-2}\beta^2$

(C) $\alpha^2\beta+2\alpha\beta^2$ (D) $\left(\alpha+\frac{1}{\alpha}\right)\left(\beta+\frac{1}{\alpha}\right)$

14. The quadratic equation with one root $\frac{1}{1+i}$ is-

(A) $2x^2 + 2x + 1 = 0$ (B) $2x^2 - 2x + 1 = 0$

(C) $2x^2 + 2x - 1 = 0$ (D) $2x^2 - 2x - 1 = 0$

15. If α and β are roots of $x^2 - 2x + 3 = 0$, then the equation whose roots are $\frac{\alpha-1}{\alpha+1}$ and $\frac{\beta-1}{\beta+1}$ will be -

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

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

16. The roots of the equation $ax^2 + bx + c = 0$ will be imaginary if -

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

(B) $a > 0, b = 0, c > 0$

(C) $a = 0, b > 0, c > 0$

(D) $a > 0, b > 0, c = 0$

17. If roots of the equation $\ell x^2 + mx - 2 = 0$ are reciprocal of each other, then-

(A) $\ell = 2$ (B) $\ell = -2$

(C) $m = 2$ (D) $m = -2$

18. If one of the roots of $x(x + 2) = 4 - (1 - ax^2)$ tends ∞, then a will tend to-

(A) 0 (B) –1 (C) 1 (D) 2

19. If both the roots of the equations $k(6x^2 + 3) + rx + 2x^2 - 1 = 0$ & $6k(2x^2 + 1) + px + 4x^2 - 2 = 0$ are common, then $2r - p$ is equal to -

(A) 1 (B) – 1 (C) 2 (D) 0

20. The quadratic equations $x^2 - 6x + a = 0$ and $x^2 - cx + 6 = 0$ have one root in common. The other roots of the first and second equations are integers in the ratio 4 : 3. Then the common root is

(A) 4 (B) 3 (C) 2 (D) 1

21. If the equations $x^2 + 2x + 3 = 0$ and $ax^2 + bx + c = 0$, a, b, c $\in$ R, have a common root, then a : b : c is –

(A) 1 : 3 : 2 (B) 3 : 1 : 2

(C) 1 : 2 : 3 (D) 3 : 2 : 1

22. If the sum of the roots of the equation $ax^2 + bx + c = 0$ is equal to the sum of the square of their reciprocal, then-

(A) c^2b, a^2c, b^2a are in A.P.

(B) c^2b, a^2c, b^2a are in G.P.

(C) $\frac{b}{c}, \frac{a}{b}, \frac{c}{a}$ are in H.P.

(D) $\frac{b}{c}, \frac{a}{b}, \frac{c}{a}$ are in G.P.

23. If the quadratic equations $3x^2 + ax + 1 = 0$ and $2x^2 + bx + 1 = 0$ have a common root, then the value of the expression $5ab - 2a^2 - 3b^2$ is -

(A) 0 (B) 1

(C) –1 (D) None of these

24. If x is the real, then the value of the expression $\frac{2x^2+4x+1}{x^2+4x+2}$ is -

(A) any number

(B) only positive number

(C) only negative number

(D) only 1

25. If $7^{\log_7(x^2-4x+5)} = x - 1$, x may have values -

(A) 2, 3 (B) 7

(C) – 2, –3 (D) 2, – 3

26. If α, β are roots of the equation $(3x + 2)^2 + p(3x + 2) + q = 0$, then roots of $x^2 + px + q = 0$ are -

(A) α, β

(B) 3α + 2, 3β + 2

(C) $\frac{1}{3}(\alpha - 2), \frac{1}{3}(\beta - 2)$

(D) α – 2, β – 2

27. For what value of a the curve $y = x^2 + ax + 25$ touches the x-axis-

(A) 0 (B) ±5

(C) ±10 (D) None of these

28. The roots of the equation $2a^2x^2 - 2abx + b^2 = 0$ when $a < 0$ and $b > 0$ are **[2014-I]**

(A) Sometimes complex

(B) Always irrational

(C) Always complex

(D) Always real

29. If α, β are the roots of $ax^2 + bx + c = 0$ and a + h, β + h are the roots of $px^2 + qx + r = 0$, then what is h equal to ? **[2014-II]**

(A) $\frac{1}{2}\left(\frac{b}{a} - \frac{q}{p}\right)$ (B) $\frac{1}{2}\left(-\frac{b}{a} + \frac{q}{p}\right)$

(C) $\frac{1}{2}\left(\frac{b}{p} + \frac{q}{a}\right)$ (D) $\frac{1}{2}\left(-\frac{b}{p} + \frac{q}{a}\right)$

30. Consider the following statements in respect of the given equation :

$(x^2 + 2)^2 + 8x^2 = 6x(x^2 + 2)$

1. All the roots of the equation are complex
2. The sum of all the roots of the equation is 6.

Which of the above statements is/are correct ? **[2015-I]**

(A) 1 only (B) 2 only

(C) Both 1 and 2 (D) Neither 1 nor 2