QUADRATIC EQUATIONS

BASIC

ONLY ONE ALTERNATIVE IS CORRECT :

1. If α, β are the roots of $x^2 + px + q = 0$ then the value of $\alpha^3\beta + \alpha\beta^3$ is
   (a) $p^2 + q^2$ (b) $p^2q + q^2p$ (c) $p^2q - 2q^2$ (d) N.O.T.
2. If the sum of the roots of the equation $(a + 1)x^2 + (2a + 3)x + (3a + 4) = 0$ is -1, then the product of the roots is
   (a) 0 (b) 1 (c) 2 (d) 3
3. If one root of $ax^2 + bx + c = 0$ is four times the other then
   (a) $4b^2 = 5ac$ (b) $4b^2 = 25ac$ (c) $4a^2 = 25bc$ (d) N.O.T.
4. If p and q are roots of the quadratic equation $x^2 + mx + m^2 + a = 0$, then the value of $p^2 + q^2 + pq$ is
   (a) 0 (b) a (c) -a (d) $\pm m^2$
5. The ratio of the roots of the equation $x^2 + ax + a + 2 = 0$ is 2 then the value of a is
   (a) 5 or 3/2 (b) 9 or -1/2 (c) 6, -3/2 (d) N.O.T.
6. If α, β are the roots of quadratic equation $6x^2 - 6x + 1 = 0$, then $(1/2)((a + b\alpha + c\alpha^2 + d\alpha^3) + (a + b\beta + c\beta^2 + d\beta^3)) =$
   (a) $\frac{12d + 6c + 4b + a}{12}$ (b) $12a + 6b + 4c + 9d$ (c) $\frac{1}{12}(12a + 6b + 4c + 3d)$ (d) N.O.T.
7. The harmonic mean of the roots of the equation $(5 + \sqrt{2})x^2 - (4 + \sqrt{5})x + (8 + 2\sqrt{5}) = 0$ is
   (a) 2 (b) 4 (c) 7 (d) 8
8. If one roots of $x^2 + px + q = 0$ is square of the other then
   (a) $p^3 - (3p - 1)q + q^2 = 0$ (b) $p^3 - 3(3p - 1)q + q^2 = 0$ (c) $p^3 + (3p - 1)q + q^2 = 0$ (d) N.O.T.
9. If α, β are roots of the equation $x^2 - 3x + 4 = 0$ then value of $\alpha^3 - 4\alpha^2 + 7\alpha - 2$ will be
   (a) 0 (b) 1 (c) 2 (d) N.O.T.
10. The equation $ax^2 + (2b - c + a)x + 2b - c = 0$ has a root (a) 0 (b) 1 (c) -1 (d) N.O.T.
11. If the roots of the equation $a(b - c)x^2 + b(c - a)x + c(a - b) = 0$ are equal, then a, b, c are in
   (a) HP (b) GP (c) AP (d) N.O.T.
12. If α, β are roots of $x^2 + px + q = 0$ and γ, δ are the roots of $x^2 + px - r = 0$ then $(\alpha - \gamma)(\alpha - \delta)$ is equal to
   (a) $q + r$ (b) $q - r$ (c) $-(q + r)$ (d) $-(p + q + r)$
13. If the ratio of the roots of the equation $x^2 + px + q = 0$ be equal to the ratio of the roots of $x^2 + lx + m = 0$, then
   (a) $p^2m = q^2l$ (b) $pm^2 = q^2l$ (c) $p^2l = q^2m$ (d) $p^2m = l^2q$
14. The value of p for which the difference between the roots of the equation $x^2 + px + 8 = 0$ is 2 are
   (a) ± 2 (b) ± 4 (c) ± 6 (d) ± 8
15. If α, β are roots of the equation $ax^2 + bx + c = 0$ then the equation whose roots are $2\alpha + 3\beta$ and $3\alpha + 2\beta$ is
   (a) $ab\,x^2 - (a + b)cx + (a + b)^2 = 0$ (b) $ac\,x^2 - (a + c)bx + (a + c)^2 = 0$ (c) $a^2x^2 + 5abx + 6(b^2 + ac) = 0$ (d) N.O.T.
16. The equation whose roots are $\frac{a}{2b+3}$ & $\frac{b}{2a+3}$, if it is given that a, b, are roots of the eq. $x^2 + 3x + 1 = 0$
   (a) $3x^2 - 5x - 1 = 0$ (b) $5x^2 + 5x - 1 = 0$ (c) $5x^2 + 5x + 2 = 0$ (d) N.O.T.
17. The eq. $x^4 - 5x^2 + 6 = 0$ has roots = (a) ± 1 & $\pm\sqrt{2}$ (b) $\pm\sqrt{3}$ & $\pm\sqrt{7}$ (c) $\pm\sqrt{2}$ & $\pm\sqrt{3}$ (d) N.O.T.
18*. The eq. $\sqrt{\frac{2x^2+1}{x^2+1}} + 6\sqrt{\frac{x^2+1}{2x^2+1}} = 5$ has roots equal to : (a) $\pm\sqrt{\frac{3}{2}}\,i$ (b) $\pm\sqrt{\frac{2}{3}}\,i$ (c) $\pm\sqrt{\frac{8}{7}}\,i$ (d) $\pm\sqrt{\frac{7}{8}}\,i$
19. The roots of the equation $4mx^2 - 2(m + n)x + n = 0$ are : (a) complex (b) real (c) irrational (d) N.O.T.
20. The roots of the equation $(a + b + c)x^2 - 2(a + b)x + (a + b - c) = 0$ are :
   (a) complex (b) real (c) irrational (d) N.O.T.
21. If $2 + i\sqrt{3}$ is a root of $x^2 + px + q = 0$ where $p, q \in R$, then
   (a) $p = -4, q = 7$ (b) $p = 4, q = 7$ (c) $p = 4, q = -7$ (d) $p = -4, q = -7$
22. If the roots of the equation $x^2 + a^2 = 8x + 6a$ are real, then a belongs to the interval
   (a) [2, 8] (b) [-2, 8] (c) [-8, 2] (d) N.O.T.
23. The equation $x^2 - 6x + 8 + \lambda(x^2 - 4x + 3) = 0$ $\lambda \in R$, has (a) real an unequal roots for all λ
   (b) real roots for $\lambda < 0$ only (c) real roots for $\lambda > 0$ only (d) real and unequal roots for $\lambda = 0$ only
24. If x is real, then the least value of the expression $\frac{x^2 - 6x + 5}{x^2 + 2x + 1}$ is (a) -1 (b) $\frac{-1}{2}$ (c) $\frac{-1}{3}$ (d) N.O.T.

Answers : (1) c (2) c (3) b (4) c (5) c (6) c (7) b (8) a (9) c (10) c (11) a (12) c (13) d (14) c (15) d (16) b (17) c (18) a, c (19) b (20) b (21) a (22) b (23) a (24) c