CTQ - 2023

CTQ : Concept Through Questions **Year : 2023**

Topic : Quadratic Equation 02

1. If α and β are imaginary cube roots of unity, then $\alpha^4 + \beta^4 + \frac{1}{\alpha\beta}$ is equal to
   (a) 3 (b) 0 (c) 1 (d) 2 Video Solution
2. If a, b, c are all positive and in H.P., then the roots of $ax^2 + 2bx + c = 0$ are
   (a) Real (b) Imaginary
   (c) Rational (d) Equal Video Solution
3. The number of real roots of the equation $(x-1)^2 + (x-2)^2 + (x-3)^2 = 0$ is
   (a) 1 (b) 2
   (c) 3 (d) None of these Video Solution
4. $\sqrt{-1-\sqrt{-1-\sqrt{-1-\cdots\infty}}}$ is equal to
   (a) 1 (b) – 1
   (c) ω^2 (d) $-\omega$ Video Solution
5. If α and β are the roots of the equation $ax^2 + bx + c = 0, (c \neq 0)$, then the equation whose roots are $\frac{1}{a\alpha+b}$ and $\frac{1}{a\beta+b}$ is
   (a) $acx^2 - bx + 1 = 0$ (b) $x^2 - acx + bc + 1 = 0$
   (c) $acx^2 + bx - 1 = 0$ (d) $x^2 + acx - bc + 11 = 0$ Video Solution
6. If one root of the quadratic equation $ax^2 + bx + c = 0$ is equal to nth power of the other root, then the value of $(ac^n)^{\frac{1}{n+1}} + (a^n c)^{\frac{1}{n+1}}$ is equal to
   (a) b (b) $-b$ (c) $\frac{1}{b^{n+1}}$ (d) $\frac{-1}{b^{n+1}}$ Video Solution
7. The number of values of a for which $(a^2-3a+2)x^2 + (a^2-5a+6)x + a^2 - 4 = 0$ is an identity in x, is
   (a) 0 (b) 2
   (c) 1 (d) 3 Video Solution
8. The number of real solutions of the equation $\left(\frac{9}{10}\right)^x = -3 + x - x^2$ is
   (a) One (b) two
   (c) More than two (d) None of these Video Solution
9. The quadratic equation whose roots are three times the roots of $3ax^2 + 3bx + c = 0$ is
   (a) $ax^2 + 3bx + 3c = 0$ (b) $ac^2 + 3bx + c = 0$
   (c) $9ax^2 + 9bx + c = 0$ (d) $ax^2 + bx + 3c = 0$ Video Solution
10. The values of x satisfying $|x^2 + 4x + 3| + (2x + 5) = 0$ are
    (a) $-4,\ -1-\sqrt{3}$ (b) $4,\ 1+\sqrt{3}$
    (c) $-4,\ 1\ -\sqrt{3}$ (d) $-4,\ 1+\sqrt{3}$ Video Solution

11. If $x = \sqrt{\frac{2+\sqrt{3}}{2-\sqrt{3}}}$, then $x^2(x-4)^2$ is equal to
(a) 7 (b) 4 (c) 2 (d) 1 Video Solution

12. 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 Video Solution

13. If $x^2 + ax + 10 = 0$ and $x^2 + bx - 10 = 0$ have a common root, then $a^2 - b^2$ is equal to
(a) 10 (b) 20 (c) 30 (d) 40 Video Solution

14. If the roots of the equation $x^2 + px + q = 0$ are α and β and roots of the equation $x^2 - xr + s = 0$ are α^4, β^4, then the roots of the equation $x^2 - 4qx + 2q^2 = 0$ are
(a) Both negative (b) Both positive
(c) Both real (d) One negative and one positive Video Solution

15. If a, b, c are the sides of the triangle ABC such that $a \neq b \neq c$ and $x^2 - 2(a+b+c)x + 3\lambda(ab+bc+ca) = 0$ has real roots, then
(a) $\lambda < \frac{4}{3}$ (b) $\lambda > \frac{5}{3}$
(c) $\lambda \in \left(\frac{4}{3}, \frac{5}{3}\right)$ (d) $\lambda \in \left(\frac{1}{3}, \frac{5}{3}\right)$ Video Solution

16. The number of roots of the equation $|x^2 - x - 6| = x + 2$ is:
(a) 2 (b) 3
(c) 4 (d) None of these Video Solution
[NIMCET 2008]

17. Let α and β be the roots of the equation $x^2 + x + 1 = 0$. The equation whose roots are α^{19} and β^7 is:
(a) $x^2 - x - 1 = 0$ (b) $x^2 + x - 1 = 0$
(c) $x^2 - x + 1 = 0$ (d) $x^2 + x + 1 = 0$ Video Solution
[NIMCET 2008]

18. If a, b are the roots of $x^2 + px + 1 = 0$ and c, d are the roots of $x^2 + qx + 1 = 0$, the values of E = (a – c)(b – c)(a + d)(b + d) is:
(a) $p^2 - q^2$ (b) $q^2 - p^2$
(c) $q^2 + p^2$ (d) None of these Video Solution
[NIMCET 2008]

19. If $2x^4 + x^3 - 11x^2 + x + 2 = 0$, then the values of $x + \frac{1}{x}$ are
(a) -3, 5/2 (b) -5/2, 3
(c) 2/5, 1/3 (d) 1/3, -5 Video Solution
[NIMCET 2009]

20. The number of distinct integral values of 'a' satisfying the equation $2^{2a} - 3(2^{a+2}) + 2^5 = 0$ is :
(a) 0 (b) 1 (c) 2 (d) 3 Video Solution
[NIMCET 2009]

21. Find the value of k in the equation $x^3 - 6x^2 + kx + 64 = 0$, if it is known that the roots of the equation are in geometric progression
(a) 24 (b) 16 (c) -16 (d) -24 Video Solution
[NIMCET 2009]

22. If $x < -1$ and $2^{|x+1|} - 2^x = |2^x - 1| + 1$, then the value of x is :

(a) -2 (b) 2
(c) 0 (d) 1 Video Solution
[NIMCET 2009]

23. The value of $X^4 + 9X^3 + 35X^2 - X + 4$ for $X = -5 + 2\sqrt{-4}$ is:
(a) 0 (b) –160
(c) 160 (d) –164 Video Solution
[NIMCET 2010]

24. If $x^2 + 2ax + 10 - 3a > 0$ for all $x \in$ R, then
(a) -5<a<2 (b) a<-5
(c) a>5 (d) 2<a<5 Video Solution
[NIMCET 2014]

25. If x and y are positive real numbers satisfying the system of equations $x^2 + y\sqrt{xy} = 336$, $y^2 + x\sqrt{xy} = 112$, then $x + y$ is
(a) $\sqrt{448}$ (b) $\sqrt{224}$ (c) 20 (d) 40 Video Solution
[NIMCET 2014]

26. If α and β are the roots of the equations $2x^2 + 2px + p^2 = 0$ where, p is a non-zero real number and α^4 and β^4 are the roots of $x^2 - rx + s = 0$, then the roots of $2x^2 - 4p^2x + 4p - 2r = 0$ are
(a) real and unequal (b) equal and zero
(c) imaginary (d) equal and non-zero Video Solution
[NIMCET 2014]

27. a, b and c are positive integers such that $a^2 + 2b^2 - 2bc = 100$ and $2ab - c^2 = 100$. Then, the value of $\frac{a+b}{c}$ is
(a) 10 (b) 100 (c) 2 (d) 20 Video Solution
[NIMCET 2015]

28. The value of k for which the equation $(k-2)x^2 + 8x + k + 4 = 0$ has both real, distinct and negative roots is
(a) 0 (b) 2 (c) 3 (d) – 4 Video Solution
[NIMCET 2015]

29. Sum of the roots of the equation $4^x - 3(2^{x+3}) + 128 = 0$ is
(a) 5 (b) 6 (c) 7 (d) 8 Video Solution
[NIMCET 2016]

30. The equation $(x - a)^3 + (x - b)^3 + (x - c)^3 = 0$ has
(a) All three real roots (b) One real and two imaginary roots
(c) Three real roots, namely x = a, x = b, x = c (d) None of these Video Solution
[NIMCET 2017]

31. If α,β are the roots of the an equation$x^2 - 2x\cos\theta + 1 = 0$, then the equation having α^n and β^n is
(a) $x^2 - (2\cos n\theta)\,x + 1 = 0)$ (b) $2x^2 - (2\cos n\theta)x - 1 = 0$ Video Solution
(c) $x^2 + (2\cos n\theta)x + 1 = 0$ (d) $x^2 + (2\cos n\theta)x - 1 = 0$
[NIMCET 2017]

32. Let α,β be the roots of the equation $x^2 - px + r = 0$ and $\frac{\alpha}{2}, 2\beta$ be the roots of the equation $x^2 - qx + r = 0$. Then the value of r is

(a) $\frac{2}{9}(p-q)(2q-p)$ (b) $\frac{2}{9}(q-p)(2q-p)$

(c) $\frac{2}{9}(q-2p)(2q-p)$ (d) $\frac{2}{9}(2p-q)(2q-p)$ Video Solution

[NIMCET 2018]

33. Let P(x) be a quadratic polynomial such that p(0)=1. If p(x) leaves remainder 4 when divided by x-1 and it leaves remainder 6 when divided by x+1, then

(a) p(-2)=11 (b) p(2)=11

(c) p(2)=19 (d) p(-2)=19 Video Solution

[NIMCET 2019]

34. Number of real solutions of the equation $\sin(e^x) = 5^x + 5^{-x}$ is

(a) 0 (b) 1

(d) 2 (d) Infinitely many Video Solution

[NIMCET 2019]

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

(a) 1/2 (b) 2

(c) 3 (d) 1/3 Video Solution

[NIMCET 2019]

36. If $a + b + c = 0$, then the value of $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$ is:

(a) 1 (b) 0 (c) 3 (d) -1 Video Solution

[NIMCET 2020]

37. Roots of equation $ax^2 - 2bx + c = 0$ are n and m, then the value of $\frac{b}{an^2+c} + \frac{b}{am^2+c}$ is

(a) $\frac{c}{a}$ (b) $\frac{b}{a}$ (c) $\frac{a}{c}$ (d) $\frac{b}{c}$ Video Solution

[NIMCET 2020]

38. If α≠β and $\alpha^2 = 5\alpha - 3, \beta^2 = 5\beta - 3$, then the equation whose roots are $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ is

(a) $3x^2 - 25x + 3 = 0$ (b) $3x^2 + 5x + 3 = 0$

(c) $3x^2 - 5x + 3 = 0$ (d) $3x^2 - 19x + 3 = 0$ Video Solution

[NIMCET 2021]

39. For what value of p, the polynomial $x^4 - 3x^3 + 2px^2 - 6$ is exactly divisible by (x-1)

(a) 2 (b) 4 (c) 6 (d) 8 Video Solution

[NIMCET 2021]

40. If the roots of the quadratic equation $x^2 + px + q = 0$ are tan30° and tan15° respectively, then the value of $2 + p - q =$

(a) 3 (b) 0 (c) 1 (d) None of these Video Solution

[NIMCET 2022]

Answer Key

Ques.	1	2	3	4	5	6	7	8	9	10
Ans.	B	B	D	C	A	B	C	D	A	A
Ques.	11	12	13	14	15	16	17	18	19	20
Ans.	D	C	D	C	A	B	D	B	A	C
Ques.	21	22	23	24	25	26	27	28	29	30
Ans.	D	A	B	A	C	A	C	C	C	B
Ques.	31	32	33	34	35	36	37	38	39	40
Ans.	A	D	D	A	D	C	D	D	B	C