CTQ - 2023

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

Topic :Trigonometric Equation

1. If $\tan\theta, \cos\theta, \frac{1}{6}\sin\theta$ are in G.P., then general value of θ is
   (a) $2n\pi \pm \frac{\pi}{3}, n \in Z$ (b) $2n\pi \pm \frac{\pi}{6}, n \in Z$
   (c) $n\pi + (-1)^n \frac{\pi}{3}, n \in Z$ (d) nπ+π/3,n∈Z Video Solution
2. The number of values of x in the interval [0,3π] satisfying the equation $2\sin^2 x + 5\sin x - 3 = 0$ is
   (a) 6 (b) 1
   (c) 2 (d) 4 Video Solution
3. If $\sec\theta \tan\theta = \sqrt{2}$, then θ=
   (a) $n\pi + (-1)^n \frac{\pi}{4}, n \in Z$ (b) $2n\pi \pm \frac{\pi}{3}, n \in Z$
   (c) $n\pi \pm \frac{2\pi}{3}, n \in Z$ (d) $n\pi - \frac{\pi}{4}, n \in Z$ Video Solution
4. The number of values of x lying in the interval (-π,π) which satisfy the equation $8^{(1+|\cos x|+\cos^2 x+|\cos^3 x|+..\infty)} = 4^3$, is
   (a) 3 (b)4
   (c)5 (d)6 Video Solution
5. The number of values of x for which $\sin 2x + \cos 4x = 2$, is
   (a) 0 (b) 1
   (c) 2 (d) infinite Video Solution
6. If $\tan 2x = \tan\frac{2}{x}$, then the value of x is
   (a) $\frac{n\pi \pm \sqrt{n^2\pi^2+16}}{4}$ (b) $\frac{n\pi}{4}$
   (c) $\frac{n\pi \pm \sqrt{n^2\pi^2-16}}{4}$ (d) None of these Video Solution
7. The set of values of x for which $\frac{\tan 3x - \tan 2x}{1+\tan 3x \tan 2x} = 1$ is
   (a) Φ (b) $\left\{\frac{\pi}{4}\right\}$
   (c) $\left\{n\pi + \frac{\pi}{4}, n = 1,2,3, \ldots\right\}$ (d) $\left\{2n\pi + \frac{\pi}{4}, n = 1,2,3, \ldots\right\}$ Video Solution
8. The number of values of x in the interval [0,5π] satisfying the equation $3\sin^2 x - 7\sin x + 2 = 0$ is
   (a) 0 (b) 5
   (c) 6 (d) 10 Video Solution
9. If $\sin\theta = \sqrt{3}\cos\theta, -\pi < \theta < 0$, then θ is equal to
   (a) -5π/6 (b) -4π/6
   (c) 4π/6 (d) 5π/6 Video Solution
10. The general value of θ satisfying $\sin^2\theta + \sin\theta = 2$ is

(a) $n\pi + (-1)^n \frac{\pi}{6}$ (b) $2n\pi + \frac{\pi}{4}$
(c) $n\pi + (-1)^n \frac{\pi}{2}$ (d) $n\pi + (-1)^n \frac{\pi}{3}$ Video Solution

11. The largest positive solution of $1 + \sin^4 x = \cos^2 3x$ in [-5π/2,5π/2] is
(a) π (b) 2 π
(c) 5π/2 (d)None of these Video Solution

12. The equation $\sqrt{3}\sin x + \cos x = 4$ has
(a) Infinity many solutions (b) No solution
(c) Two solutions (d) Only one solution Video Solution

13. If $\sin\left(\frac{\pi}{4}\cot\theta\right) = \cos\left(\frac{\pi}{4}\tan\theta\right)$, then θ is equal to
(a) $2n\pi + \frac{\pi}{4}$ (b) $2n\pi \pm \frac{\pi}{4}$
(c) $2n\pi - \frac{\pi}{4}$ (d) nπ+π/4 Video Solution

14. The function $f(x) = 2\sin x + \sin 2x,\ x \in [0,\ 2\pi]$ has absolute maximum and minimum at
(a) $\frac{\pi}{3}, \frac{5\pi}{3}$ (b) $\frac{\pi}{3},\ \pi$
(c) $\frac{5\pi}{3},\ \pi$ (d) none of these Video Solution
[NIMCET 2008]

15. The solution of $sin\ x + 1 = cos\ x$ such that $0 \le x \le 2\pi$
(a) 0,π (b) 0, π/2
(c) π/2, 3π/2 (d) 0, 3π/2 Video Solution
[NIMCET 2013]

16. The number of the solutions of the equation $\sin x + \sin 5x = \sin 3x$ lying in the interval [0,π] is
(a) 4 (b) 6
(c) 5 (d) 2 Video Solution
[NIMCET 2018]

17. If $\sin^2 x \tan x + \cos^2 x \cot x - \sin 2x = 1 + \tan x + \cot x, x \in (0, \pi)$, then x
(a) 3π/12, 5π/12 (b) 5π/12, 7π/12
(c) 7π/12, 11π/12 (d) 7π/12, 9π/12 Video Solution
[NIMCET 2019]

18. If $3\ sin\ x\ +\ 4\ cos\ x\ =\ 5$, then $6\tan\frac{x}{2} - 9\tan^2\frac{x}{2} =$
(a) 1 (b) 3
(c) 4 (d) 6 Video Solution
[NIMCET 2020]

19. Solve the equation $\sin^2 x - \sin x - 2 = 0$ for x on the interval $0 \le x < 2\pi$:
(a) x=3π/2 only (b) x=π/4 and 2π/7
(c) x=2π/3 and 2π/5 (d) None of these Video Solution
[NIMCET 2020]

20. If $32\tan^8\theta = 2\cos^2\alpha - 3\cos\alpha$ and $3\cos 2\theta = 1$, then the general value of α for
(a) nπ±π/3 (b) 2nπ±2π/3
(c) 2nπ±π/3 (d) nπ±2π/3 Video Solution
[NIMCET 2021]

21. The general value of θ, satisfying the equation, $\sin\theta = -\frac{1}{2}$, $\tan\theta = \frac{1}{\sqrt{3}}$ is:

(a) $n\pi + \frac{\pi}{6}, n \in I$ (b) $n\pi + (-1)^n (7\pi/6), n \in I$

(c) $2n\pi + \frac{7\pi}{6}$ (d) $2n\pi + \frac{11\pi}{6}, n \in I$ Video Solution

[NIMCET 2021]

22. If |k|=5 and 0°≤θ≤360°, then the number of distinct solutions of $3\cos\theta + 4\sin\theta = k$ is

(a) 0 (b) 1

(c) 2 (d) infinite Video Solution

[NIMCET 2021]

23. The solutions of the equation $4\cos^2 x + 6\sin^2 x = 5$ are

(a) $x = n\pi \pm \frac{\pi}{4}$ (b) $x = n\pi \pm \frac{\pi}{3}$

(c) $x = n\pi \pm \frac{\pi}{2}$ (d) $x = n\pi \pm \frac{2\pi}{3}$ Video Solution

[NIMCET 2022]

Answer Key

Ques.	1	2	3	4	5	6	7	8	9	10
Ans.	A	D	A	B	A	A	A	C	B	C
Ques.	11	12	13	14	15	16	17	18	19	20
Ans.	B	B	D	A	D	B	C	A	A	B
Ques.	21	22	23							
Ans.	C	C	A							