Trigonometry

1. Number of solution of $\tan[2x] = \tan[6x]$ in $(0,3\pi)$
   a) 4
   b) 5
   c) 3
   d) None of these
2. No. of values of *x* in the interval $[0,5\pi]$ satisfying the equation $3\sin^2 x - 7\sin x + 2 = 0$ is
   a) 0
   b) 2
   c) 6
   d) 8
3. The No. of different value of θ satisfying the equation cosθ+cos2θ= -1, and at same time satisfying the condition $0<\theta<360°$ is
   a) 1
   b) 2
   c) 3
   d) 4
4. The general value of *x* satisfying the equation $2\cot^2 x + 2\sqrt{3}\,\text{Cot}\,x + 4\,\text{Cosec}\,x + 8 = 0$ is where $n \in 1$
   a) $n\pi - \frac{\pi}{6}$
   b) $n\pi + \frac{\pi}{6}$
   c) $2n\pi - \frac{\pi}{6}$
   d) $2n\pi + \frac{\pi}{6}$
5. No. of solutions of $\sum_{r=1}^{5} \text{Cos}rx = 5$ in the interval $[0,4\pi)$ is
   a) 0
   b) 2
   c) 3
   d) 7
6. Smallest positive *x* satisfying the equation $\text{Cos}^3 3x + \text{Cos}^3 5x = 8\text{Cos}^3 4x.\text{Cos}^3 x$ is
   a) 15°
   b) 18°
   c) 22.5°
   d) 30°
7. General solution of $4\,\text{Sin}^2 x + \tan^2 x + \text{Cosec}^2 x + \text{Cot}^2 x - 6 = 0$ is $n \in 1$:
   a) $n\pi \pm \frac{\pi}{4}$
   b) $2n\pi \pm \frac{\pi}{4}$
   c) $n\pi + \frac{\pi}{3}$
   d) $n\pi - \frac{\pi}{6}$
8. The value of $\text{Sec}^2(\tan^{-1}2) + \text{Cosec}^2(\text{Cot}^{-1}3)$ is
   a) 14
   b) 15

c) 16
d) 17

9. The no. of solutions of equation $\text{Cos}^{-1}(1-x)+m\ \text{Cos}^{-1}x=\frac{n\pi}{2}$ (where m > 0, n$\leq$ 0)
   a) 0
   b) 1
   c) 2
   d) None of these
10. The complete solution set of the inequality $(\text{Cos}^{-1}x)^2-(\text{Sin}^{-1})^2>0$ is :
   a) $\left[0,\ \frac{1}{\sqrt{2}}\right]$
   b) $\left[-1,\ \frac{1}{\sqrt{2}}\right]$
   c) $[-1,\ 1]$
   d) $\left[-1,\ \frac{1}{2}\right]$
11. Let α,β are the roots of the equation $x^2+7x+k(k-3)=0$, where Kϵ(0,3) and K is a constant. Then the value of $\tan^{-1}\alpha+\tan^{-1}\beta+\tan^{-1}\frac{1}{\alpha}+\tan^{-1}\frac{1}{\beta}$ is
   a) π
   b) $\frac{\pi}{2}$
   c) 0
   d) $\frac{-\pi}{2}$
12. If $(\tan^{-1}x)^2+(\cot^{-1}x)^2=\frac{5\pi^2}{8}$, then x equals to
   a) -1
   b) 1
   c) 0
   d) $\sqrt{3}$
13. The total number of ordered pairs (*x,y*) satisfying $|y|=\text{Cos}\ x$ and $y=\sin-1(\sin x)$ where *x* ϵ $(-2\pi, 3\pi)$ is equal to
   a) 2
   b) 4
   c) 5
   d) 6
14. The no. of ordered pair [s] [*x,y*] of real numbers satisfying the equation $1+x^2+2x\ \text{Sin}\ (\text{Cos}^{-1}y)=0\ is$
   a) 0
   b) 1
   c) 2
   d) 3
15. The complete set of values of *x* for which $2\tan^{-1}x+\text{Cos}^{-1}\left[\frac{1-x}{1+x^2}\right]$ is independent if x is
   a) (-∞, 0]
   b) [0, ∞)
   c) (-∞, −1]
   d) [1, ∞)

16. The number of real values of *x* satisfying the equation $3\text{Sin}^{-1}x + \pi x - \pi = 0$ is / are
    a) 0
    b) 1
    c) 2
    d) 3
17. Range of f(*x*) = $\text{Sin}^{-1}x + x^2 + 4x + 1$ is
    a) $\left[\frac{-\pi}{2} - 2, \frac{\pi}{2} + 6\right]$
    b) $[0, \frac{\pi}{2} + 6]$
    c) $[\frac{-\pi}{2} - 2, \infty]$
    d) $[-3, \infty)$
18. Maximum value of $\text{Cos}x(\text{Sin}x + \text{Cos}x)$ is equal to
    a) $\sqrt{2}$
    b) 2
    c) $\frac{\sqrt{2}+1}{2}$
    d) $\sqrt{2} + 1$
19. The no. of solutions of the equation $4\text{sin}^2x + \text{tan}^2x + \text{Cot}^2x + \text{Cosec}^2x = 6$ in $[0, 2\pi]$
    a) 1
    b) 2
    c) 3
    d) 4
20. If Sin A, Cos A and tan A are in G.P. then $\text{Cos}^3\text{A} + \text{Cos}^2A$ is equal to
    a) 1
    b) 2
    c) 4
    d) $\sqrt{2}$
21. If A + B + C = 180° then $\frac{\text{Cos A Cos C} + \text{Cos}(\text{A}+\text{B})\,\text{Cos}(\text{B}+\text{C})}{\text{Cos A Sin C} - \text{Sin}[\text{A}+\text{B}]\,Cos\,(B+C)}$ simplifies to
    a) – Cot C
    b) 0
    c) Tan C
    d) Cot C
22. If $\text{A} = \sqrt{\text{Sin}2 - \text{Sin}\sqrt{3}}$, B = $\sqrt{\text{Cos}2 - \text{Cos}\sqrt{3}}$, then which of the following statement is true
    a) A and B both are real numbers and A > B
    b) A and B both are real numbers and A < B
    c) Exactly one of A & B is not real number
    d) Both A & B are not real numbers
23. tan (100°) + tan (125°) + tan (100°) + tan (125°) =
    a) 0
    b) $\frac{1}{2}$
    c) -1
    d) 1

24. The value of $\text{Sin}^{-1}(\sin 12) + \text{Cos}^{-1}(\text{Cos}12)$ is equal to
    a) 0
    b) $24 - 2\pi$
    c) $4\pi - 24$
    d) $12 - 4\pi$
25. If $(\text{Cos}^{-1}x)^2 + (\text{Cos}^{-1}y)^2 = 2\pi^2$ then $x^5 + y^5 =$
    a) -2
    b) 1
    c) -1
    d) 0