DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 10**

Topic :- TRIGONOMETRIC FUNCTIONS

1. The greatest and least value of $\sin x \cos x$ are respectively
   a) $1, -1$ b) $\frac{1}{2}, -\frac{1}{2}$ c) $\frac{1}{4}, -\frac{1}{4}$ d) $2, -2$
2. If $x = X\cos\theta - Y\sin\theta, y = X\sin\theta + Y\cos\theta$ and $x^2 + 4xy + y^2 = AX^2 + BY^2, 0 \le \theta \le \frac{\pi}{2}, n \in Z$, then
   a) $\theta = \frac{\pi}{6}, A = 3, B = 1$ b) $\theta = \frac{\pi}{2}, A = 3, B = 1$ c) $A = 3, B = -1, \theta = \frac{\pi}{4}$ d) $A = -3, B = 1, \theta = \frac{\pi}{4}$
3. The number of values of x in $[0, 2\pi]$ satisfying the equation $3\cos 2x - 10\cos x + 7 = 0$ is
   a) 1 b) 2 c) 3 d) 4
4. $\cos\alpha \sin(\beta - \gamma) + \cos\beta \sin(\gamma - \alpha) + \cos\gamma \sin(\alpha - \beta)$ is equal to
   a) 0 b) $\frac{1}{2}$ c) 1 d) $4\cos\alpha \cos\beta \cos\gamma$
5. If $A + B = 45°$, then $(\cot A - 1)(\cot B - 1)$ is equal to
   a) 1 b) $\frac{1}{2}$ c) -1 d) 2
6. The solution of the equation $[\sin x + \cos x]^{1+\sin 2x} = 2, -\pi \le x \le \pi$ is
   a) $\frac{\pi}{2}$ b) π c) $\frac{\pi}{4}$ d) $\frac{3\pi}{4}$
7. If $\sin x + \sin^2 x = 1$, then the value of $\cos^{12} x + 3\cos^{10} x + 3\cos^8 x + \cos^6 x + 2\cos^4 x + \cos^2 x - 2$, is equal to
   a) 0 b) 1 c) 2 d) $\sin^2 x$
8. $\sin^4\frac{\pi}{8} + \sin^4\frac{3\pi}{8} + \sin^4\frac{5\pi}{8} + \sin^4\frac{7\pi}{8}$ is equal to
   a) 1 b) 3/2 c) 2 d) 1 /4
9. If $\sin(x + 3\alpha) = 3\sin(\alpha - x)$, then
   a) $\tan x = \tan\alpha$ b) $\tan x = \tan^2\alpha$ c) $\tan x = \tan^3\alpha$ d) $\tan x = 3\tan\alpha$
10. $\cos\alpha\sin(\beta - \gamma) + \cos\beta\sin(\gamma - \beta) + \cos\gamma\sin(\alpha - \beta) =$
    a) 0 b) 1/2 c) 1 d) $4\cos\alpha\cos\beta\cos\gamma$
11. If $\sin A + \cos A = m$ and $\sin^3 A + \cos^3 A = n$, then
    a) $m^3 - 3m + n = 0$ b) $n^3 - 3n + 2m = 0$ c) $m^3 - 3m + 2n = 0$ d) $m^3 + 3m + 2n = 0$
12. If $(\sec\theta - 1) = (\sqrt{2} - 1)\tan\theta$, then $\theta =$
    a) $n\pi + \frac{\pi}{8}, n \in Z$
    b) $2n\pi, 2n\pi + \frac{\pi}{4}, n \in Z$
    c) $2n\pi, n \in Z$
    d) None of these
13. The number of values of θ in the interval $[-\pi, \pi]$ satisfying the equation $\cos\theta + \sin 2\theta = 0$ is
    a) 1 b) 2 c) 3 d) 4

14. The general solution of $\tan\left(\frac{\pi}{2}\sin\theta\right) = \cot\left(\frac{\pi}{2}\cos\theta\right)$ is

a) $\theta = 2r\,\pi + \frac{\pi}{2}, r \in Z$

b) $\theta = 2r\,\pi, r \in Z$

c) $\theta = 2r\,\pi + \frac{\pi}{2}$ and $\theta = 2r\,\pi, r \in Z$

d) None of these

15. The most general values of θ satisfying $\tan\theta + \tan\left(\frac{3\pi}{4} + \theta\right) = 2$ are given by

a) $2n\pi \pm \frac{\pi}{3}, n \in Z$ b) $n\pi + \frac{\pi}{3}, n \in Z$ c) $2n\pi \pm \frac{\pi}{6}, n \in Z$ d) $n\pi \pm \frac{\pi}{6}, n \in Z$

16. If $(1 + \tan\theta)(1 + \tan\phi) = 2$, then $\theta + \phi =$

a) 30° b) 45° c) 60° d) 75°

17. If α and β satisfying $2\sec 2\alpha = \tan\beta + \cot\beta$, then $\alpha + \beta$ is equal to

a) $\frac{\pi}{2}$ b) $\frac{\pi}{3}$ c) $\frac{\pi}{4}$ d) π

18. If $0 < \theta < 2\pi$, then the intervals of values of θ for which $2\sin^2\theta - 5\sin\theta + 2 > 0$, is

a) $\left(0, \frac{\pi}{6}\right) \cup \left(\frac{5\pi}{6}, 2\pi\right)$ b) $\left(\frac{\pi}{8}, \frac{5\pi}{6}\right)$ c) $\left(0, \frac{\pi}{8}\right) \cup \left(\frac{\pi}{6}, \frac{5\pi}{6}\right)$ d) $\left(\frac{41\pi}{48}, \pi\right)$

19. If $\tan A - \tan B = x$ and $\cot B - \cot A = y$, then $\cot(A - B)$ is equal to

a) $\frac{1}{x} + y$ b) $\frac{1}{xy}$ c) $\frac{1}{x} - \frac{1}{y}$ d) $\frac{1}{x} + \frac{1}{y}$

20. In a ΔABC, if a, c, b are in A.P., then the value of $\frac{a\cos B - b\cos A}{a - b}$, is

a) 3 b) 2 c) 1 d) None of these