DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 3**

Topic :-INVERSE TRIGONOMETRICE FUNCTIONS

1. $5\cos^{-1}\left(\frac{1-x^2}{1+x^2}\right) + 7\sin^{-1}\left(\frac{2x}{1+x^2}\right) - 4\tan^{-1}\left(\frac{2x}{1-x^2}\right) - \tan^{-1}x = 5\pi$, then x is equal to
   a) 3 b) $-\sqrt{3}$ c) $\sqrt{2}$ d) $\sqrt{3}$

2. If $\sin^{-1}x + \sin^{-1}y + \sin^{-1}z = \frac{3\pi}{2}$ and $f(1) = 2$, $f(p+q) = f(p).f(q), \forall\, p, q \in R$, then $x^{f(1)} + y^{f(2)} + z^{f(3)} - \frac{(x+y+z)}{x^{f(1)}+y^{f(2)}+z^{f(3)}}$ is equal to
   a) 0 b) 1 c) 2 d) 3

3. $\cot^{-1}\left(\sqrt{\cos\alpha}\right) - \tan^{-1}\left(\sqrt{\cos\alpha}\right) = x$, then $\sin x$ is equal to
   a) $\tan^{-2}\left(\frac{\alpha}{2}\right)$ b) $\cot^2\left(\frac{\alpha}{2}\right)$ c) $\tan\alpha$ d) $\cot\left(\frac{\alpha}{2}\right)$

4. The value of $\cot^{-1}9 + \text{cosec}^{-1}\frac{\sqrt{41}}{4}$ is
   a) $\frac{\pi}{2}$ b) $\frac{\pi}{4}$ c) $\frac{\pi}{3}$ d) π

5. $\sum_{m=1}^{n}\tan^{-1}\left(\frac{2m}{m^4+m^2+2}\right)$ is equal to
   a) $\tan^{-1}\left(\frac{n^2+n}{n^2+n+2}\right)$ b) $\tan^{-1}\left(\frac{n^2-n}{n^2-n+2}\right)$ c) $\tan^{-1}\left(\frac{n^2+n+2}{n^2+n}\right)$ d) None of these

6. If $\cos^{-1}\frac{3}{5} - \sin^{-1}\frac{4}{5} = \cos^{-1}x$, then x is equal to
   a) 0 b) 1 c) -1 d) None of these

7. If $\cot(\cos^{-1}x) = \sec\left(\tan^{-1}\frac{a}{\sqrt{b^2-a^2}}\right)$, then x is equal to
   a) $\frac{b}{\sqrt{2b^2-a^2}}$ b) $\frac{a}{\sqrt{2b^2-a^2}}$ c) $\frac{\sqrt{2b^2-a^2}}{a}$ d) $\frac{\sqrt{2b^2-a^2}}{b}$

8. The equation $\sin^{-1}x - \cos^{-1}x = \cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$ has
   a) No solution b) Unique solution
   c) Infinite number of solutions d) None of the above

9. If $\theta = \sin^{-1}x + \cos^{-1}x - \tan^{-1}x \geq 0$, then the smallest interval in which θ lies, is given by
   a) $\frac{\pi}{2} \leq \theta \leq \frac{3\pi}{4}$ b) $-\frac{\pi}{4} \leq \theta \leq 0$ c) $0 \leq \theta \leq \frac{\pi}{4}$ d) $\frac{\pi}{4} \leq \theta \leq \frac{\pi}{2}$

10. Solution of the equation $\cot^{-1}x + \sin^{-1}\frac{1}{\sqrt{5}} = \frac{\pi}{4}$ is

a) $x = 3$ b) $x = \frac{1}{\sqrt{5}}$ c) $x = 0$ d) None of these

11. $\sin\left(\frac{1}{2}\cos^{-1}\frac{4}{5}\right)$ is equal to
a) $-\frac{1}{\sqrt{10}}$ b) $\frac{1}{\sqrt{10}}$ c) $-\frac{1}{10}$ d) $\frac{1}{10}$

12. If $\sin^{-1}\left(\frac{3}{x}\right) + \sin^{-1}\left(\frac{4}{x}\right) = \frac{\pi}{2}$, then x is equal to
a) 3 b) 5 c) 7 d) 11

13. If $[\cot^{-1} x] + [\cos^{-1} x] = 0$, where x is a non-negative real number and [.] denotes the greatest integer function, then complete set of values of x is
a) $(\cos 1, 1]$b) $(\cot 1, 1)$c) $(\cos 1, \cot 1)$d) None of these

14. If $3\sin^{-1}\frac{2x}{1+x^2} - 4\cos^{-1}\frac{1+x}{1+x^2} + 2\tan^{-1}\frac{2x}{1-x^2} = \frac{\pi}{3}$, then value of x is
a) $\sqrt{3}$ b) $\frac{1}{\sqrt{3}}$ c) 1 d) None of these

15. Sum of infinite terms of the series
$\cot^{-1}\left(1^2 + \frac{3}{4}\right) + \cot^{-1}\left(2^2 + \frac{3}{4}\right) + \cot^{-1}\left(3^2 + \frac{3}{4}\right) + \ldots$is
a) $\frac{\pi}{4}$ b) $\tan^{-1}(2)$ c) $\tan^{-1} 3$ d) None of these

16. $2\tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{1}{7}\right)$is equal to
a) $\left(\frac{49}{29}\right)$ b) $\frac{\pi}{2}$ c) $-\left(\frac{49}{29}\right)$ d) $\frac{\pi}{4}$

17. The number of triplets (x, y, z)satisfying $\sin^{-1} x + \cos^{-1} y + \sin^{-1} z = 2\pi$,is
a) 0 b) 2 c) 1 d) Infinite

18. The value of $\sin(\cot^{-1} x)$ is
a) $\sqrt{1+x^2}$ b) x c) $(1+x^2)^{-3/2}$ d) $(1+x^2)^{-1/2}$

19. If $\cos^{-1} x + \cos^{-1} y = \frac{\pi}{2}$and $\tan^{-1} x - \tan^{-1} y = 0$,then $x^2 + xy + y^2$is equal to
a) 0 b) $\frac{1}{\sqrt{2}}$ c) $\frac{3}{2}$ d) $\frac{1}{8}$

20. If $-1 < x < 1$, then $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$ equals
a) $2\tan^{-1} x$ b) $-\pi + 2\tan^{-1} x$ c) $\pi + 2\tan^{-1} x$ d) None of these