DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 5**

Topic :-INVERSE TRIGONOMETRICE FUNCTIONS

1. The solution set of the equation $\tan^{-1}x - \cot^{-1}x = \cos^{-1}(2-x)$is
   a) $[0,1]$ b) $[-1,1]$ c) $[1,3]$ d) None of these

2. $\cos^{-1}\left\{\frac{1}{2}x^2 + \sqrt{1-x^2}\sqrt{1-\frac{x^2}{4}}\right\} = \cos^{-1}\frac{x}{2} - \cos^{-1}x$holds for
   a) $|x| \le 1$ b) $x \in R$ c) $0 \le x \le 1$ d) $-1 \le x \le 0$

3. The solutions of the equation $\tan^{-1}(x+1) + \tan^{-1}(x-1) = \tan^{-1}\frac{8}{31}$ are
   a) $-\frac{1}{4}, 8$ b) $\frac{1}{4}, -8$ c) $-4, \frac{1}{8}$ d) $4, -\frac{1}{8}$

4. 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

5. If $x^2 + y^2 + z^2 = r^2$, then
$\tan^{-1}\left(\frac{xy}{zr}\right) + \tan^{-1}\left(\frac{yz}{xr}\right) + \tan^{-1}\left(\frac{xz}{yr}\right)$is equal to
   a) π b) $\frac{\pi}{2}$ c) 0 d) None of these

6. The greatest and the least values of $(\sin^{-1}x)^3 + (\cos^{-1}x)^3$ are respectively
   a) $-\frac{\pi}{2}, \frac{\pi}{2}$ b) $-\frac{\pi^3}{8}, \frac{\pi^3}{8}$ c) $\frac{\pi^3}{32}, \frac{7\pi^3}{8}$ d) None of these

7. For the principle value branch of the graph of the function $y = \sin^{-1}x$, $-1 \le x \le 1$, which among the following is a true statement?
   a) Graph is symmetric about the x-axis b) Graph is symmetric about the y-axis
   c) Graph is not continuous d) The line $x = 1$ is a tangent

8. If $-1 \le x \le -\frac{1}{\sqrt{2}}$, then $\sin^{-1}\left(2x\sqrt{1-x^2}\right)$ equals
   a) $2\sin^{-1}x$ b) $\pi - 2\sin^{-1}x$ c) $-\pi - 2\sin^{-1}x$ d) None of these

9. If a, b, c be positive real number and the value of

$$\theta = \tan^{-1}\sqrt{\frac{a(a+b+c)}{bc}} + \tan^{-1}\sqrt{\frac{b(a+b+c)}{ca}} + \tan^{-1}\sqrt{\frac{c(c+b+c)}{ab}}$$

Then tan θ is equal to

a) 0 b) 1 c) $\frac{a+b+c}{abc}$ d) None of these

10. If $\theta \in [4\pi, 5\pi]$, then $\cos^{-1}(\cos\theta)$ equals

a) $-4\pi + \theta$ b) $5\pi - \theta$ c) $4\pi - \theta$ d) $\theta - 5\pi$

11. The trigonometric equation $\sin^{-1} x = 2\sin^{-1} a$, has a solution for

a) $\frac{1}{2} < |a| < \frac{1}{\sqrt{2}}$ b) All real values of a c) $|a| \leq \frac{1}{2}$ d) $|a| \geq \frac{1}{\sqrt{2}}$

12. The number of solutions of the equation $\sin^{-1} x + \sin^{-1} 2x = \frac{\pi}{3}$, is

a) 0 b) 1 c) 2 d) Infinite

13. If $2\sin^{-1} x = \sin^{-1}\left(2x\sqrt{1-x^2}\right)$, then x is equal to

a) $[-1,1]$ b) $\left[-\frac{1}{\sqrt{2}},1\right]$ c) $\left[-\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}}\right]$ d) None of these

14. If $\cos^{-1} x + \cos^{-1} y + \cos^{-1} z = \pi$, then

a) $x^2 + y^2 = z^2$ b) $x^2 + y^2 + z^2 = 0$

c) $x^2 + y^2 + z^2 = 1 - 2xyz$ d) None of the above

15. The value of $\cot\left(\text{cosec}^{-1}\frac{5}{3} + \tan^{-1}\frac{2}{3}\right)$ is

a) $\frac{5}{17}$ b) $\frac{6}{17}$ c) $\frac{3}{17}$ d) $\frac{4}{17}$

16. If $\sin^{-1} x + \sin^{-1} y + \sin^{-1} z = \pi$, then$x^4 + y^4 + z^4 + 4x^2y^2z^2 = k(x^2y^2 + y^2z^2 + z^2x^2)$ Where k is equal to

a) 1 b) 2 c) 4 d) none of these

17. If $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \pi$, then the value of $x + y + z$ is

a) $-xyz$ b) xyz c) $\frac{1}{xyz}$ d) 0

18. The value of $\cos^{-1}(\cos 12) - \sin^{-1}(\sin 14)$ is

a) 2 b) $8\pi - 26$ c) $4\pi + 2$ d) None of these

19. If $\frac{1}{2} \leq x \leq 1$, then $\sin^{-1}(3x - 4x^3)$ equals

a) $3\sin^{-1} x$ b) $\pi - 3\sin^{-1} x$ c) $-\pi - 3\sin^{-1} x$ d) None of these

20. The value of $\sin^{-1}\{\cos(4095°)\}$ is equal to

a) $-\frac{\pi}{3}$ b) $\frac{\pi}{6}$ c) $-\frac{\pi}{4}$ d) $\frac{\pi}{4}$