CHAPTER-2

INVERSE TRIGONOMETRIC FUNCTIONS

MULTIPLE CHOICE QUESTIONS

Sl. No	Question:
1.	If $x = \tan^{-1}(tan\frac{5\pi}{4})$ and $y = \tan^{-1}(-tan\frac{2\pi}{3})$, then A) $4x = 3y$ B) $3x = 4y$ C) $x - y = \pi/8$ D) $x - y = \pi/6$
2.	The value of $\tan(\cos^{-1}\frac{4}{5} + \tan^{-1}\frac{2}{3})$ is : A) $\frac{13}{6}$ B) $\frac{17}{6}$ C) $\frac{19}{6}$ D) $\frac{23}{6}$
3.	If $\sin^{-1}x + \sin^{-1}y = \frac{2\pi}{3}$, then the value of $\cos^{-1}x + \cos^{-1}y$ is : A) $\frac{\pi}{3}$ B) $\frac{\pi}{6}$ C) $\frac{2\pi}{3}$ D) $\frac{5\pi}{3}$
4.	If $\sin^{-1}x - \cos^{-1}x = \frac{\pi}{6}$, then x is equal to: A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $-\frac{\sqrt{3}}{2}$
5.	The value of $\cos^{-1}(cos\frac{2\pi}{3}) + \sin^{-1}\left(sin\frac{\pi}{3}\right)$is :

	A) $\frac{\pi}{2}$ B) $\frac{4\pi}{3}$ C) π D) $3\pi/4$
6.	The value of $\cos[\tan^{-1}\frac{3}{4}]$ is : A) $\frac{3}{5}$ B) $\frac{3}{4}$ C) $\frac{4}{5}$ D) $\frac{4}{3}$
7.	If $x = \cot^{-1}(-\frac{1}{5})$ and x lies in 2nd quadrant , then the value of $sinx$ is : A) $\frac{1}{\sqrt{26}}$ B) $-\frac{1}{\sqrt{26}}$ C) $\frac{5}{\sqrt{26}}$ D) $-\frac{5}{\sqrt{26}}$
8.	If $x = \sin^{-1}(-\frac{1}{2}) + 2\cos^{-1}(-\frac{\sqrt{3}}{2})$, then x is A) $\frac{\pi}{2}$ B) $-\frac{\pi}{2}$ C) $\frac{3\pi}{2}$ D) $\frac{5\pi}{6}$
9.	The value of $\sin[\cot^{-1}\{\cos(\tan^{-1}1)\}]$ is : A) $\sqrt{\frac{3}{2}}$ B) $\sqrt{\frac{2}{3}}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{1}{\sqrt{2}}$
10.	The value of $sec^2[\tan^{-1}2] + cosec^2[\cot^{-1}3]$ is :

	A) 5 B) 10 C)15 D) 20
11.	If $4\sin^{-1}x + \cos^{-1}x = \pi$, then the value of x is : A) $\frac{1}{2}$ B) $\frac{1}{\sqrt{2}}$ C) $\frac{\sqrt{3}}{2}$ D) 1
12.	The value of $\sin^{-1}(\pi\sqrt{x}) + \cos^{-1}(\pi\sqrt{x})$ is : A) π B) $\frac{\pi}{2}\sqrt{x}$ C) $\pi\sqrt{x}$ D) $\frac{\pi}{2}$
13.	If $\tan^{-1}x + 2\cot^{-1}x = \frac{2\pi}{3}$, then the value of x is A) 3 B) $\sqrt{3}$ C) $\frac{\sqrt{3}-1}{\sqrt{3}+1}$ D) $\frac{1}{\sqrt{3}}$
14.	Which of the following corresponds to the principal value branch of $\cot^{-1}x$ A) $[0,\pi]$ B) $(0,\pi)$ C) $[-\frac{\pi}{2},\frac{\pi}{2}]$ D) $(-\frac{\pi}{2},\frac{\pi}{2})$
15.	If $\tan^{-1}x = \frac{\pi}{10}$ for some real values of x , then the value of $\cot^{-1}x$ is :A) $\frac{\pi}{5}$ B) $\frac{2\pi}{5}$ C) $\frac{3\pi}{5}$

	D) $\frac{10}{\pi}$

16.	Find the value of $\tan^{-1}\sqrt{3} + \sec^{-1}(-2)$ (A) $-\frac{\pi}{3}$ (B) π (C) $\frac{\pi}{3}$ (D) $-\pi$
17.	Evaluate : $\tan^{-1}(tan\frac{5\pi}{6})$ (A) $\frac{\pi}{6}$ (B) $-\frac{\pi}{3}$ (C) $\frac{5\pi}{6}$ (D) $-\frac{\pi}{6}$
18.	Find the principal value of $\tan^{-1}\sqrt{3}$ + $\cot^{-1}(-\sqrt{3})$ is (A) $\frac{7\pi}{6}$ (B) $\frac{\pi}{6}$ (C) $-\frac{5\pi}{6}$ (D) $\frac{5\pi}{3}$
19.	Find the principal value of $\tan^{-1}[\sin(-\frac{\pi}{2})]$ is (A) $\frac{\pi}{4}$ (B) $\frac{-3\pi}{4}$ (C) $\frac{-\pi}{4}$ (D) $\frac{-\pi}{2}$
20.	Find the value of: $sin\left[\frac{\pi}{3} - sin^{-1}\left(-\frac{1}{2}\right)\right]$ (A) -1 (B) 0 (C) 2 (D) 1

21.	If $\tan^{-1}\sqrt{3} + \cot^{-1} x = \frac{\pi}{2}$, find the value of x (A) $\sqrt{3}$ (B) $-\sqrt{3}$ (C) $2\sqrt{3}$ (D) $\sqrt{3}/2$
22.	Evaluate : $\cos^{-1}(cos\frac{7\pi}{6})$ (A) $\frac{7\pi}{6}$ (B) $\frac{\pi}{6}$ (C) $\frac{-7\pi}{6}$ (D) $\frac{5\pi}{6}$
23.	Write the principal value of $\cos^{-1}\left(-\frac{1}{2}\right)$ (A) $\frac{7\pi}{6}$ (B) $\frac{2\pi}{3}$ (C) $\frac{\pi}{6}$ (D) $\frac{-\pi}{6}$
24.	Write the principal value of: $2\sin^{-1}\frac{1}{2} + \cos^{-1}\frac{1}{2}$ (A) $\frac{\pi}{3}$ (B) 0 (C) $\frac{2\pi}{3}$ (D) $-\frac{\pi}{3}$
25.	Find the value of $\cos^{-1}\left(\cos\frac{2\pi}{3}\right) + \sin^{-1}\left(\sin\frac{2\pi}{3}\right)$ (A) $\frac{2\pi}{3}$ (B) $\frac{4\pi}{3}$ (C) $-\pi$ (D) π
26.	Find the value of $\mathbf{\tan^{-1}\left[2\cos\left(2\sin^{-1}\frac{1}{2}\right)\right]}$

	(A) $\frac{\pi}{4}$ (B) $\frac{\pi}{3}$ (C) $\frac{\pi}{6}$ (D) $\frac{2\pi}{3}$
27.	Evaluate : $\tan^{-1}(tan\frac{5\pi}{6})$ (A) $-\frac{\pi}{3}$ (B) $\frac{-\pi}{6}$ (C) $\frac{5\pi}{6}$ (D) $\frac{\pi}{3}$
28.	If $\sin\left\{\sin^{-1}\frac{1}{2}+\cos^{-1}x\right\}=1$, then find the value of x (A) -1 (B) $\frac{1}{2}$ (C) 1 (D) $-\frac{1}{2}$
29.	Find the Principal value of $cos^{-1}\left(cos\frac{7\pi}{3}\right)+\ tan^{-1}\left(tan\frac{5\pi}{6}\right)$. (A) $\frac{\pi}{3}$ (B) $-\frac{\pi}{3}$ (C) $-\frac{\pi}{6}$ (D) $\frac{2\pi}{3}$
30.	Evaluate $\tan^{-1}\left[2\sin\left(2\cos^{-1}\frac{\sqrt{3}}{2}\right)\right]$ (A) $\frac{\pi}{3}$ (B) $-\frac{\pi}{3}$ (C) $\frac{\pi}{6}$ (D) $-\frac{\pi}{6}$

Sl. No.	**Question**

31.	The value of $\sin^{-1}(\cos(33\pi/5))$ is a) $3\pi/5$ b) $-7\pi/5$ c) $\pi/10$ d) $-\pi/10$
32.	What is the value of $\sin^{-1}(-x)$ for all x belongs to [-1, 1]? a) $-\sin^{-1}(x)$ b) $\sin^{-1}(x)$ c) $2\sin^{-1}(x)$ d) $\sin^{-1}(-x)/2$
33.	What is the value of $\sin^{-1}(\sin 6)$? a) $-2\pi - 6$ b) $2\pi + 6$ c) $-2\pi + 6$ d) $2\pi - 6$
34.	What is the value of $\cos^{-1}(-x)$ for all $x \in [-1, 1]$? a) $\cos^{-1}(-x)$ b) $\pi - \cos^{-1}(x)$ c) $\pi - \cos^{-1}(-x)$ d) $\pi + \cos^{-1}(x)$
35.	$\tan^{-1}\sqrt{3} + \sec^{-1}2 - \cos^{-1}1$ is equal to _____ a) 0 b) $2\pi/3$ c) $\pi/3$ d) $\pi/4$
36.	What is the principle value of $\sec^{-1}(2/\sqrt{3})$. a) $\pi/6$ b) $\pi/3$ c) $\pi/4$ d) $\pi/2$
37.	What is the value of $\tan^{-1}(1/\sqrt{3}) - \sin^{-1}1 + \cos^{-1}(1/2)$ is _____ a) 2π b) $\pi/2$

	c) π d) 0
38.	The domain of $\sin^{-1}(3x)$ is equal to a) [-1, 1] b) $[-1/3,1/3]$ c) [-3, 3] d) $[-3\pi, 3\pi]$
39.	What is the value of $5\cos^{-1}(1/2) + 7\sin^{-1}(-1/2)$? a) $-\pi/2$ b) π c) $\pi/2$ d) $17\pi/6$
40.	The value of $\sin^{-1}(\sin(4\pi/3))$ is a) π b) $\pi/3$ c) $4\pi/3$ d) $-\pi/3$
41.	If $\cos^{-1}x=y$, then which of the following is correct? a) $0 \leq y \leq \pi$ b) $0 < y < \pi$ c) $(-\pi/2) \leq y \leq (\pi/2)$ d) $(-\pi/2) < y < (\pi/2)$
42.	The value of the expression $2\sec^{-1}2 + \sin^{-1}(1/2)$ is a) $\pi/6$ b) $5\pi/6$ c) $7\pi/6$ d) 1
43.	The domain of the function $\cos^{-1}(2x - 1)$ is a) [0, 1] b) $[-1, 1]$ c) (-1, 1) d) $[0, \pi]$
44.	What is the value of $\cos^{-1}\cos(2\pi/3) + \sin^{-1}\sin(\pi/3)$?

	a) π b) $\pi/2$ c) $3\pi/4$ d) $4\pi/3$
45.	Which of the following is the principal value branch of $\text{cosec}^{-1}x$? a) $(-\pi/2, \pi/2)$ b) $[0, \pi] - \{\pi/2\}$ c) $[-\pi/2, \pi/2]$ d) $[-\pi/2, \pi/2] - \{0\}$

46.	Which of the following is the principle value branch of $\cos^{-1} x$? (A) $(0, \pi)$ (B) $[-\frac{\pi}{2}, \frac{\pi}{2}]$ (C) $[0, \pi]$ (D) $(-\frac{\pi}{2}, \frac{\pi}{2})$
47.	If $\sin^{-1} x + \sin^{-1} y = \frac{\pi}{2}$, then value of $\cos^{-1} x + \cos^{-1} y =$? (A) $\frac{\pi}{2}$ (B) 0 (C) $-\frac{\pi}{2}$ (D) None of these
48.	Which of the following corresponds to the principle value branch of $\tan^{-1} x$? (A) $(-\frac{\pi}{2}, \frac{\pi}{2})$ (B) $[-\frac{\pi}{2}, \frac{\pi}{2}]$ (C) $(-\frac{\pi}{2}, \frac{\pi}{2}) - \{0\}$ (D) $(0, \pi)$
49.	The value of $\sin^{-1}[\cos\frac{43\pi}{5}]$ is (A) $\frac{3\pi}{5}$ (B) $-\frac{7\pi}{5}$

	(C) $\frac{\pi}{10}$ (D) $-\frac{\pi}{10}$
50.	The principle value of the expression $\cos^{-1}[\cos(-680°)$ is (A) $\frac{2\pi}{9}$ (B) $-\frac{2\pi}{9}$ (C) $\frac{\pi}{9}$ (D) $\frac{34\pi}{9}$
51.	If $\tan^{-1} x = \frac{\pi}{10}$, for some $x \in R$, then the value of $\cot^{-1} x$ is : (A) $\frac{\pi}{5}$ (B) $\frac{2\pi}{5}$ (C) $\frac{3\pi}{5}$ (D) $\frac{4\pi}{5}$
52.	The domain of $\sin^{-1} 2x$ is : (A) [0, 1] (B) $[-1, 1]$ (C) $[-\frac{1}{2}, \frac{1}{2}]$ (D) $[-2, 2]$
53.	The greatest and least values of $(\sin^{-1} x)^2 + (\cos^{-1} x)^2$ are respectively : (A) $\frac{5\pi^2}{4}$and $\frac{\pi^2}{8}$ (B) $\frac{\pi}{2}$ and $-\frac{\pi}{2}$ (C) $\frac{\pi^2}{4}$ and $-\frac{\pi^2}{4}$ (D) $\frac{\pi^2}{4}$ and 0 .
54.	The domain of the function $y = \sin^{-1}(-x^2)$ is : (A) [0, 1] (B) (0, 1) (C) $[-1, 1]$ (D) $\emptyset$

55.	The domain of the function $y = \cos^{-1}(x^2 - 4)$ is : (A) [3, 5] (B) $[0, \pi]$ (C) $[-\sqrt{5}, -\sqrt{3}] \cap [\sqrt{3}, \sqrt{5}]$ (D) $[-\sqrt{5}, -\sqrt{3}] \cup [\sqrt{3}, \sqrt{5}]$
56.	The value of the expression $\sin[\cot^{-1}\{\cos(\tan^{-1} 1)\}]$ is : (A) 0 (B) 1 (C) $\frac{1}{\sqrt{3}}$ (D) $\sqrt{\frac{2}{3}}$
57.	If $\alpha \leq 2\sin^{-1} x + \cos^{-1} x \leq \beta$, then (A) $\alpha = -\frac{\pi}{2}, \beta = \frac{\pi}{2}$ (B) $\alpha = 0, \beta = \pi$ (C) $\alpha = -\frac{\pi}{2}, \beta = \frac{3\pi}{2}$ (D) $\alpha = 0, \beta = 2\pi$
58.	The value of $\tan^2(\sec^{-1} 2) + \cot^2(\text{cosec}^{-1} 3)$ is : (A) 5 (B) 11 (C) 13 (D) 15
59.	The value of $\sin\{2\sin^{-1}(0.6)\}$ is : (A) 0.48 (B) 0.96 (C) 1.2 (D) 0.25
60.	Evaluate : $\sin^{-1}\frac{1}{2} + \cos^{-1}\frac{1}{\sqrt{2}}$ (A) $\frac{5\pi}{12}$ (B) $\frac{7\pi}{12}$ (C) $-\frac{5\pi}{12}$

	(D) $\frac{5\pi}{6}$

61.	If $\sin^{-1}\frac{x}{5} + \text{cosec}^{-1}\frac{5}{4} = \frac{\pi}{2}$ then find the value of x (A) 4 (B) 5 (C) 3 (D) 1
62.	The value of $\cos^{-1}(\cos\frac{13\pi}{6})$ is (A) $\frac{13\pi}{6}$ (B) $\frac{7\pi}{6}$ C) $\frac{5\pi}{6}$ (D) $\frac{\pi}{6}$
63.	The value of $\tan^{-1}2 + \tan^{-1}3$ is : (A) $\frac{3\pi}{4}$ (B) π (C) $-\frac{\pi}{4}$ (D) $\frac{\pi}{4}$
64.	If $\tan^{-1}x + \tan^{-1}y + \tan^{-1}z = \pi$, then the value of x + y + z is (A) 0 (B) $\frac{1}{2}$ (C) $\frac{\pi}{2}$ (D) xyz
65.	If $\sin^{-1}x - \cos^{-1}x = \frac{\pi}{6}$, then x is equal to :

	(A) $\frac{1}{2}$ (B) $\frac{\sqrt{3}}{2}$ (C) $-\frac{1}{2}$ (D) $-\frac{\sqrt{3}}{2}$
66.	The value of $\tan(2\tan^{-1}\frac{1}{5}-\frac{\pi}{4})$ is (A) $\frac{7}{17}$ (B) $-\frac{7}{17}$ (C) $\frac{7}{12}$ (D) $-\frac{7}{12}$
67.	The value of cos ($\tan^{-1}\frac{3}{4}$) is (A) $\frac{3}{5}$ (B) $\frac{4}{5}$ (C) $-\frac{3}{5}$ (D) None
68.	If $\tan^{-1}(1-x)$, $\tan^{-1}x$, $\tan^{-1}(1+x)$ are in A.P., then value of x^3+x^2 is (A) 0 (B) 1 (C) -1 (D) $x-1$
69.	If $\cos^{-1}x = \sin^{-1}x$, then the value of x is: (A) 0 (B) 1 (C) $\frac{1}{\sqrt{2}}$ (D) $\frac{\sqrt{3}}{2}$
70.	If $x<0$, $y<0$ such that $xy = 1$, then $\tan^{-1}x + \tan^{-1}y$ is : (A) $\frac{\pi}{2}$ (B) $-\frac{\pi}{2}$

	C) $-\pi$ (D) None of these
71.	The principal value of $\cos^{-1}(\cos(-680°))$ is: (A) $\frac{2\pi}{9}$ (B) $-\frac{2\pi}{9}$ (C) $\frac{34\pi}{9}$ (D) $\frac{\pi}{9}$
72.	If $\sin^{-1}x - \sin^{-1}y = \frac{\pi}{2}$, $\cos^{-1}x + \cos^{-1}y = \frac{\pi}{2}$, then (x, y) is (A) (1,1) (B) (0,1) (C) (1,0) (D) (1,-1)
73.	If $\tan^{-1}(\tan\frac{5\pi}{4})$, $\beta = \tan^{-1}(-\tan\frac{2\pi}{3})$, then (A) $4\alpha = 3\beta$ (B) $3\alpha = 4\beta$ (C) $\alpha - \beta = \frac{7\pi}{12}$ (D) none of these

KEY/ANSWERS

MULTIPLE CHOICE QUESTION

Q. No.	Answer
1	A
2	B
3	A
4	C
5	C
6	C
7	C
8	C
9	B

10	C
11	A
12	D
13	B
14	B
15	B
16	A
17	D
18	A
19	C
20	D
21	A
22	D
23	B
24	C
25	D
26	A
27	B
28	B
29	C
30	A
31	D
32	A
33	C
34	B
35	B
36	A
37	C
38	B
39	C
40	D
41	A
42	B

43	A
44	A
45	D
46	(C) $[0, \pi]$
47	(A) $\frac{\pi}{2}$
48	(A) $(-\frac{\pi}{2}, \frac{\pi}{2})$
49	(D) $-\frac{\pi}{10}$
50	(A) $\frac{2\pi}{9}$
51	(B) $\frac{2\pi}{5}$
52	(C) $[-\frac{1}{2}, \frac{1}{2}]$
53	(A) $\frac{5\pi^2}{4}$and $\frac{\pi^2}{8}$
54	(C) $[-1, 1]$
55	(D) $[-\sqrt{5}, -\sqrt{3}] \cup [\sqrt{3}, \sqrt{5}]$
56	(D) $\sqrt{\frac{2}{3}}$
57	(B) $\alpha = 0, \beta = \pi$
58	(B) 11
59	(B) 0.96
60	(A) $\frac{5\pi}{12}$
61	Answer-(C)
62	Answer-(D)
63	Answer-(A)
64	Answer-(D)
65	Answer-(B)
66	Answer-(B)
67	Answer-(B)
68	Answer-(B)

69	Answer-(C)
70	Answer-(B)
71	Answer-(A)
72	Answer-(C)
73	Answer-(A)

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