Q1. 21 January Shift 1

If the domain of the function $f(x)=\cos^{-1}\left(\frac{2x-5}{11-3x}\right)+\sin^{-1}\left(2x^2-3x+1\right)$ is the interval $[\alpha,\beta]$, then $\alpha+2\beta$ is equal to :

(1) 3 (2) 5 (3) 1 (4) 2

Q2. 21 January Shift 2

Let the maximum value of $\left(\sin^{-1}x\right)^2+\left(\cos^{-1}x\right)^2$ for $x\in\left[-\frac{\sqrt{3}}{2},\frac{1}{\sqrt{2}}\right]$ be $\frac{\mathrm{m}}{\mathrm{n}}\pi^2$, where $\gcd(\mathrm{m},\mathrm{n})=1$. Then $\mathrm{m}+\mathrm{n}$ is equal to ____.

Q3. 22 January Shift 1

The number of solutions of $\tan^{-1}4x+\tan^{-1}6x=\frac{\pi}{6}$, where $-\frac{1}{2\sqrt{6}}<x<\frac{1}{2\sqrt{6}}$, is equal to

(1) 3 (2) 0 (3) 2 (4) 1

Q4. 24 January Shift 2

If the domain of the function $f(x)=\sin^{-1}\left(\frac{1}{x^2-2x-2}\right)$, is $(-\infty,\alpha]\cup[\beta,\gamma]\cup[\delta,\infty)$, then $\alpha+\beta+\gamma+\delta$ is equal to

(1) 2 (2) 3 (3) 4 (4) 5

Q5. 28 January Shift 1

If $k=\tan\left(\frac{\pi}{4}+\frac{1}{2}\cos^{-1}\left(\frac{2}{3}\right)\right)+\tan\left(\frac{1}{2}\sin^{-1}\left(\frac{2}{3}\right)\right)$, then the number of solutions of the equation $\sin^{-1}(kx-1)=\sin^{-1}x-\cos^{-1}x$ is ____

Q6. 28 January Shift 2

Considering the principal values of inverse trigonometric functions, the value of the expression $\tan\left(2\sin^{-1}\left(\frac{2}{\sqrt{13}}\right)-2\cos^{-1}\left(\frac{3}{\sqrt{10}}\right)\right)$ is equal to :

(1) $\frac{16}{63}$ (2) $-\frac{33}{56}$ (3) $-\frac{16}{63}$ (4) $\frac{33}{56}$

ANSWER KEYS

1. (1) **2.** 65 **3.** (4) **4.** (3) **5.** 1 **6.** (4)