Q1. 21 January Shift 1

The value of $\operatorname{cosec} 10^\circ - \sqrt{3}\sec 10^\circ$ is equal to :

(1) 8 (2) 6 (3) 2 (4) 4

Q2. 22 January Shift 1

If $\frac{\cos^2 48^\circ - \sin^2 12^\circ}{\sin^2 24^\circ - \sin^2 6^\circ} = \frac{\alpha+\beta\sqrt{5}}{2}$, where $\alpha, \beta \in \mathbb{N}$, then $\alpha + \beta$ is equal to _____

Q3. 22 January Shift 2

Let $\cos(\alpha+\beta) = -\frac{1}{10}$ and $\sin(\alpha-\beta) = \frac{3}{8}$, where $0 < \alpha < \frac{\pi}{3}$ and $0 < \beta < \frac{\pi}{4}$. If $\tan 2\alpha = \frac{3(1-r\sqrt{5})}{\sqrt{11}(s+\sqrt{5})}, r, s \in N$, then $r + s$ is equal to ____ .

Q4. 23 January Shift 1

Let α and β respectively be the maximum and the minimum values of the function $f(\theta) = 4\left(\sin^4\left(\frac{7\pi}{2} - \theta\right) + \sin^4(11\pi + \theta)\right) - 2\left(\sin^6\left(\frac{3\pi}{2} - \theta\right) + \sin^6(9\pi - \theta)\right), \theta \in \mathbf{R}$. Then $\alpha + 2\beta$ is equal to :

(1) 4 (2) 6 (3) 5 (4) 3

Q5. 23 January Shift 2

The least value of $\left(\cos^2\theta - 6\sin\theta\cos\theta + 3\sin^2\theta + 2\right)$ is

(1) -1 (2) 1 (3) $4 - \sqrt{10}$ (4) $4 + \sqrt{10}$

Q6. 23 January Shift 2

Let $\frac{\pi}{2} < \theta < \pi$ and $\cot\theta = -\frac{1}{2\sqrt{2}}$. Then the value of
$\sin\left(\frac{15\theta}{2}\right)(\cos 8\theta + \sin 8\theta) + \cos\left(\frac{15\theta}{2}\right)(\cos 8\theta - \sin 8\theta)$
is equal to

(1) $-\frac{\sqrt{2}}{\sqrt{3}}$ (2) $\frac{\sqrt{2}-1}{\sqrt{3}}$ (3) $\frac{\sqrt{2}}{\sqrt{3}}$ (4) $\frac{1-\sqrt{2}}{\sqrt{3}}$

Q7. 24 January Shift 1

If $\cot x = \frac{5}{12}$ for some $x \in \left(\pi, \frac{3\pi}{2}\right)$, then $\sin 7x\left(\cos\frac{13x}{2} + \sin\frac{13x}{2}\right) + \cos 7x\left(\cos\frac{13x}{2} - \sin\frac{13x}{2}\right)$ is equal to

(1) $\frac{4}{\sqrt{26}}$ (2) $\frac{6}{\sqrt{26}}$ (3) $\frac{5}{\sqrt{13}}$ (4) $\frac{1}{\sqrt{13}}$

Q8. 24 January Shift 1

The value of $\frac{\sqrt{3}\operatorname{cosec} 20^\circ - \sec 20^\circ}{\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ}$ is equal to

(1) 16 (2) 32 (3) 64 (4) 12

Q9. 28 January Shift 1

If $\frac{\tan(A-B)}{\tan A}+\frac{\sin^2 C}{\sin^2 A}=1,\ A,\ B, C \in \left(0, \frac{\pi}{2}\right)$, then

(1) $\tan A, \tan C, \tan B$ are in A.P.

(2) $\tan A, \tan B, \tan C$ are in G.P.

(3) $\tan A, \tan C, \tan B$ are in G.P.

(4) $\tan A, \tan B, \tan C$ are in A.P.

ANSWER KEYS

1. (4) **2.** 4 **3.** 20 **4.** (3) **5.** (3) **6.** (4) **7.** (4) **8.** (3)

9. (3)