1. The domain of $\sin^{-1}\left[\log_3\left(\frac{x}{3}\right)\right]$ is

(1) $[1, 9]$
(2) $[-1, 9]$
(3) $[-9, 1]$
(4) $[-9, -1]$

2. The domain of the function $f(x)=\frac{1}{\sqrt{|\tan x|-\tan x}}$ is

(1) $\left(n\pi,\ n\pi+\frac{\pi}{2}\right),\ n\in \mathrm{I}$
(2) $\left(n\pi+\frac{\pi}{2},\ n\pi+\pi\right),\ n\in \mathrm{I}$
(3) $\left(2n\pi,\ 2n\pi+\frac{\pi}{2}\right),\ n\in \mathrm{I}$
(4) None of these

3. The domain of $f(x)=\frac{\log_2(x+3)}{x^2+3x+2}$ is

(1) $R-\{-1,-2\}$
(2) $(-2,\ \infty)$
(3) $R-\{-1,-2,-3\}$
(4) $(-3,\ \infty)-\{-1,-2\}$

4. If the domain of $f(x)$ is $[1, 3]$, then the domain of $f\left(\log_2\left(x^2+3x-2\right)\right)$ is

(1) $[-5,-4]\cup[1, 2]$
(2) $[-13,-2]\cup\left[\frac{3}{5}, 5\right]$
(3) $[4, 1]\cup[2, 7]$
(4) $[-3, 2]$

5. The range of the function $f(x)=\frac{1}{2-\cos 3x}$ is

(1) $(-2, \infty)$
(2) $[-2, 3]$
(3) $\left[\frac{1}{3}, 1\right]$
(4) $\left(\frac{1}{2}, 1\right)$

6. If x is real, then the value of the expression $\frac{x^2+14x+9}{x^2+2x+3}$ lies between

(1) 5 and 4
(2) 5 and -4
(3) -5 and 4
(4) None of these

7. The range of the function $f(x)=\log_e\left(3x^2+4\right)$ is equal to

(1) $[\log_e 2, \infty)$
(2) $[\log_e 3, \infty)$
(3) $[2\log_e 3, \infty)$
(4) $[2\log_e 2, \infty)$

8. The period of the function $f(\theta)=\sin\frac{\theta}{3}+\cos\frac{\theta}{2}$ is

(1) 3π
(2) 6π
(3) 9π
(4) 12π

9. The fundamental period of the function $f(x)=|\sin\ x|+|\cos\ x|$ is

(1) π
(2) $\pi/2$
(3) 2π
(4) None of these

10. The function $f(x)=\log\left(x+\sqrt{x^2+1}\right)$ is

(1) An even function
(2) An odd function
(3) A periodic function
(4) Neither an even nor an odd function