1. The value of the integral $\int \frac{e^{5\log x}-e^{4\log x}}{e^{3\log x}-e^{2\log x}}dx$ is equal to (Where C is constant of integration)

(1) x^2+C (2) $\frac{x^3}{3}+C$

(3) $\frac{x^2}{2}+C$ (4) None of these

2. $\int \frac{5\left(x^6+1\right)}{x^2+1}dx$ is equal to

(1) $5\left(x^7+x\right)\tan^{-1}x+C$ (2) $x^5-\frac{5}{3}x^3+5x+C$

(3) $3x^4-5x^2+15x+C$ (4) $5\tan^{-1}\left(x^2+1\right)+\log\left(x^2+1\right)+C$

3. $\int \sin^3 x dx =$

(1) $-\frac{3}{4}\cos x+\frac{\cos 3x}{12}+C$ (2) $-\frac{2}{3}\cos x+\frac{\cos 3x}{12}+C$

(3) $-\frac{3}{4}\cos x+\frac{\cos 3x}{10}-C$ (4) $\frac{3}{4}\cos x-\frac{\cos 3x}{10}-C$

4. $\int \frac{1+x+\sqrt{x+x^2}}{\sqrt{x}+\sqrt{1+x}}dx$ is equal to -

(1) $\frac{1}{2}\sqrt{1+x}+C$ (2) $\frac{2}{3}(1+x)^{3/2}+C$

(3) $\sqrt{1+x}+C$ (4) $2(1+x)^{3/2}+C$

5. $\int \sqrt{\frac{1-x}{1+x}}\,dx =$

(1) $\sin^{-1}x-\frac{1}{2}\sqrt{1-x^2}+c$ (2) $\sin^{-1}x+\frac{1}{2}\sqrt{1-x^2}+c$

(3) $\sin^{-1}x-\sqrt{1-x^2}+c$ (4) $\sin^{-1}x+\sqrt{1-x^2}+c$

6. The integral $\int \frac{\sin^2 x\cos^2 x}{\left(\sin^5 x+\cos^3 x\sin^2 x+\sin^3 x\cos^2 x+\cos^5 x\right)^2}dx$ is equal to:

(1) $\frac{-1}{3(1+\tan^3 x)}+C$ (2) $\frac{1}{1+\cot^3 x}+C.$

(3) $\frac{-1}{1+\cot^3 x}+C$ (4) $\frac{1}{3(1+\tan^3 x)}+C$ (where C is a constant of integration)

7. $\int \sqrt[3]{\frac{\sin^n x}{\cos^{n+6} x}}dx,\ n\in N$ is equal to -

(1) $\frac{3}{n}(\tan x)^{\frac{n}{3}+1}+c$ (2) $\frac{3}{3+n}(\tan x)^{\frac{n}{3}+1}+c$

(3) $\frac{3}{n}(\cos x)^{n+1}+c$ (4) None of these

8. $\int \frac{\cos x-\sin x}{7-9\sin 2x}dx =$

(1) $\frac{1}{24}\log\left|\frac{4+3(\sin x+\cos x)}{4-3(\sin x+\cos x)}\right|+c$ (2) $\frac{1}{24}\log\left|\frac{4-3(\sin x+\cos x)}{4+3(\sin x+\cos x)}\right|+c$

(3) $\frac{1}{24}\log\left|\frac{4-(\sin x-\cos x)}{4+(\sin x-\cos x)}\right|+c$ (4) $\frac{1}{24}\log\left|\frac{4+(\sin x-\cos x)}{4-(\sin x-\cos x)}\right|+c$

9. If $\int \frac{dx}{(x-1)^{3/4}(x+2)^{5/4}}=k\left(\frac{x-1}{x+2}\right)^{1/4}+c$, then the number of divisors of 30k is

10. If $\int \frac{\sin x}{\sin(x-\alpha)}dx=Ax+B\log\sin(x-\alpha)+C$, then find value of (A,B).

(1) $(-\sin\alpha,\cos\alpha)$ (2) $(\cos\alpha,\sin\alpha)$

(3) $(\sin\alpha,\cos\alpha)$ (4) $(-\cos\alpha,\sin\alpha)$