MATHEMATICS LECTURES FOR IIT-JEE BY MANISH KALIA

Indefinite Integrals

JEE-MAINS (PREVIOUS YEAR)

MCQ-Single Correct

1. Let $I_n = \int \tan^n x dx$, (n > 1). If $I_4 + I_6 = a\tan^6 x + bx^5 + C$, where C is a constant of integration, then the ordered pair (a,b) is equal to :

(1) $\left(-\frac{1}{5},1\right)$ (2) $\left(\frac{1}{5},0\right)$

(3) $\left(\frac{1}{5},-1\right)$ (4) $\left(-\frac{1}{5},0\right)$ **[2017]**

2. The integral $\frac{\pi^2}{16}$ is equal to :

(1) $\frac{x^{10}}{2\left(x^5+x^3+1\right)^2}+C$ (2) $\frac{x^5}{2\left(x^5+x^3+1\right)^2}+C$

(3) $\frac{-x^{10}}{2\left(x^5+x^3+1\right)^2}+C$ (4) $\frac{-x^5}{\left(x^5+x^3+1\right)^2}+C$ **[2016]**

3. The integral $\int \frac{dx}{x^2\left(x^4+1\right)^{3/4}}$ equals :

(1) $\left(x^4+1\right)^{1/4}+c$ (2) $-\left(x^4+1\right)^{1/4}+c$

(3) $-\left(\frac{x^4+1}{x^4}\right)^{1/4}+c$ (4) $\left(\frac{x^4+1}{x^4}\right)^{1/4}+c$ **[2015]**

4. The integral $\int\left(1+x-\frac{1}{x}\right)e^{x+\frac{1}{x}}dx$ is equal to

(1) $\left(x-1\right)e^{x+\frac{1}{x}}+c$ (2) $xe^{x+\frac{1}{x}}+c$

(3) $(x+1)e^{x+\frac{1}{x}}+c$ (4) $-xe^{x+\frac{1}{x}}+c$ **[2014]**

5. If $\int f(x)dx=\Psi(x)$, then $\int x^5 f(x^3)dx$ is equal to **[2013]**

(1) $\frac{1}{3}x^3\Psi(x^3)-3\int x^3\Psi(x^3)d\ +Cx$ (2) $\frac{1}{3}x^3\Psi(x^3)-\int x^2\Psi(x^3)dx+C$

(3) $\frac{1}{3}\left[x^3\Psi(x^3)-\int x^3\Psi(x^3)d\ \right]+C$ (4) $\frac{1}{3}\left[x^3\Psi(x^3)-\int x^2\Psi(x^3)dx\right]+C$

6. The value of $\sqrt{2}\int\frac{\sin xdx}{\sin\left(x-\frac{\pi}{4}\right)}$ is

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

(3) $x+\log\left|\sin\left(x-\frac{\pi}{4}\right)\right|+c$ (4) $x-\log\left|\cos\left(x-\frac{\pi}{4}\right)\right|+c$ **[2008]**

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

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

(3) $\frac{xe^x}{1+x^2}+C$ (4) $\frac{x}{(\log x)^2+1}+C$ **[2005]**

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

(1) (sinα, cosα) (2) (cosα, sinα)

(3) (-sinα, cosα) (4) (-cosα, sinα) **[2004]**

9. $\int\frac{dx}{\cos x-\sin x}$ is equal to

(1) $\frac{1}{\sqrt{2}}\log\left|\tan\left(\frac{x}{2}-\frac{\pi}{8}\right)\right|+C$

(2) $\frac{1}{\sqrt{2}}\log\left|\cot\left(\frac{x}{2}\right)\right|+C$

(3) $\frac{1}{\sqrt{2}}\log\left|\tan\left(\frac{x}{2}-\frac{3\pi}{8}\right)\right|+C$

(4) $\frac{1}{\sqrt{2}}\log\left|\tan\left(\frac{x}{2}+\frac{3\pi}{8}\right)\right|+C$ **[2004]**