INDEFINITE INTEGRAL

1. If $\int \frac{\cos 4x + 1}{\cot x - \tan x} dx = k \cos 4x + c$, then

(A) $k = -\frac{1}{2}$ (B) $k = -\frac{1}{8}$ (C) $k = -\frac{1}{4}$ (D) none of these

2. $\int \frac{e^x(1+\sin x)}{1+\cos x}$ dx is equal to

(A) log |tan x| + c (B) $e^x \tan\left(\frac{x}{2}\right) + c$ (C) sin e^x cot x + c (D) e^x cot x + c

3. $\int \cos\sqrt{x}\, dx$ is equal to

(A) $2[\sqrt{x}\sin\sqrt{x} + \cos\sqrt{x}] + c$ (B) $\sin\sqrt{x} + c$

(C) $2[\sqrt{x}\cos\sqrt{x} - \sin\sqrt{x}] + c$ (D) none of these

4. $\int \frac{dx}{a^2\cos^2 x + b^2\sin^2 x}$ is equal to

(A) $\tan^{-1}\left(\frac{a}{b}\tan x\right) + c$ (B) $\frac{1}{ab}\tan^{-1}\left(\frac{b}{a}\cot x\right) + c$

(C) $\frac{1}{ab}\tan^{-1}\left(\frac{b}{a}\tan x\right) + c$ (D) $\tan^{-1}\left(\frac{b}{a}\tan x\right) + c$

5. $\int e^x \sec x(1+\tan x)\, dx$ is equal to

(A) $e^x \sec x + c$ (B) $e^x \sec x \tan x + c$ (C) $e^x \tan x + c$ (D) none of these

6. $\int \left(x + \frac{1}{x}\right)^{3/2}\left(\frac{x^2-1}{x^2}\right) dx$ is equal to

(A) $\frac{5}{2}\left(x + \frac{1}{x}\right)^{5/2} + c$ (B) $\frac{2}{5}\left(x + \frac{1}{x}\right)^{5/2} + c$ (C) $2\left(x + \frac{1}{x}\right)^{1/2} + c$ (D) none of these

7. $\int \frac{dx}{\sqrt{x+a} + \sqrt{x+b}} =$

(A) $\frac{2}{3}.\frac{1}{(a-b)}\left[(x+a)^{3/2} - (x+b)^{3/2}\right] + c$ (B) $\frac{1}{2}.\frac{1}{(a-b)}\left[(x+a)^{1/2} - (x+b)^{1/2}\right] + c$

(C) $\frac{3}{2}.\frac{1}{(a-b)}\left[(x+a)^{3/2} + (x+b)^{3/2}\right] + c$ (D) none of these

8. $\int \frac{x^2+1}{\sqrt[3]{(x^3+3x+6)}} dx =$

(A) $\frac{1}{2}(x^3+3x+6)^{-1/2} + c$ (B) - $\frac{1}{2}(x^3+3x+6)^{1/2} + c$

(C) $\frac{1}{2}(x^3+3x+6)^{2/3} + c$ (D) none of these

9. $\int \sec^4 x\, dx$ =

(A) $\tan x + \frac{\tan^2 x}{3} + c$ (B) $\tan x + \frac{\tan^3 x}{3} + c$

(C) $\tan x + \frac{\tan^4 x}{3} + c$ (D) $\frac{\tan^4 x}{4} + c$

10. $\int_0^{\pi/2} \sin^6\theta \cos^3\theta\, d\theta$ =

(A) $\frac{2}{65}$ (B) $\frac{2}{63}$

(C) $\frac{1}{63}$ (D) $\frac{3}{130}$

11. If $\int \frac{\sqrt{\cot x}}{\sin x \cos x} dx = A\sqrt{\cot x} + B$, then A =

(A) 1 (B) 2 (C) −1 (D) −2

12. If $\int \frac{(x^2-1)}{(x^4+3x^2+1)\tan^{-1}\left(\frac{x^2+1}{x}\right)} dx = k \log\left|\tan^{-1}\frac{x^2+1}{x}\right| + c$, then k is equal to

(A) 1 (B) 2 (C) 3 (D) 5

13. $\int \frac{\cos 2x}{\cos x} dx$ is equal to

(A) 2sinx + log|(secx – tanx)| + c (B) 2sinx – log |(secx – tanx)| + c

(C) 2sinx + log |(secx + tanx)| + c (D) 2sinx – log|(secx + tanx)| + c

14. $\int e^x \frac{1+\sin x}{1+\cos x} dx$ is

(A) $\frac{e^x}{1+\cos x} + c$ (B) $e^x \cot\frac{x}{2} + c$ (C) $e^x \tan\frac{x}{2} + c$ (D) None of these

15. $\int x^{13/2}\sqrt{1+x^{5/2}}\, dx$ is equal to

(A) $\frac{4}{5}\left[\frac{1}{7}(1+x^{5/2})^{7/2} - \frac{2}{5}(1+x^{5/2})^{5/2} + \frac{1}{3}(1+x^{5/2})^{3/2} + c\right]$

(B) $\frac{4}{5}\left[\frac{1}{7}(1+x^{5/2})^{7/2} - \frac{1}{5}(1+x^{5/2})^{5/2} + (1+x^{5/2})^{3/2} + c\right]$

(C) $\frac{4}{5}\left[(1+x^{5/2})^{7/2} - \frac{2}{5}(1+x^{5/2})^{5/2} + (1+x^{5/2})^{3/2} + c\right]$

(D) none of these

16. If $\int f(x)\cos x dx = \frac{1}{2}f^2(x) + c$, then f(x) can be

(A) x (B) 1

(C) cosx (D) sinx

17. The value of the integral $\int e^{\sin^2 x}(\cos x + \cos^3 x)\sin x\, dx$ is

(A) $\frac{1}{2}e^{\sin^2 x}\left(3-\sin^2 x\right)+c$

(B) $e^{\sin^2 x}\left(1+\frac{1}{2}\cos^2 x\right)+c$

(C) $e^{\sin^2 x}\left(3\cos^2 x+2\sin^2 x\right)+c$

(D) $e^{\sin^2 x}\left(2\cos^2 x+3\sin^2 x\right)+c$

18 $\int\frac{dx}{\sqrt{2x-x^2}}$ is equal to

(A) $\sin^{-1}(1-x)+c$

(B) $-\cos^{-1}(1-x)+P$

(C) $\sin^{-1}(x-1)+c$

(D) $\cos^{-1}(x-1)+P$

19. $I=\int\frac{dx}{1+e^x}dx$ is equal to

(A) $\log_e\left(\frac{1+e^x}{e^x}\right)+c$

(B) $\log_e\left(\frac{e^x}{1+e^x}\right)+c$

(C) $\log_e\left(e^x\right)\left(e^x+1\right)+c$

(D) $\log_e\left(e^{2x}+1\right)+c$

20. $I=\int e^{\tan^{-1}x}\left(\frac{1+x^2+x}{1+x^2}\right)dx$ is equal to

(A) $xe^{\tan^{-1}x}+c$

(B) $x^2e^{\tan^{-1}x}+c$

(C) $\frac{1}{x}e^{\tan^{-1}x}+c$

(D) none of these

ANSWERS

1.	B	2.	B	3.	A	4.	C
5.	A	6.	B	7.	A	8.	C
9.	B	10.	A	11.	D	12.	A
13.	D	14.	C	15.	A	16.	D
17.		18.	C	19.	B	20.	A