

## 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)  $\frac{2}{3} \cdot \frac{1}{(a-b)} [(x+a)^{3/2} - (x+b)^{3/2}] + c$  (B)  $\frac{1}{2} \cdot \frac{1}{(a-b)} [(x+a)^{1/2} - (x+b)^{1/2}] + c$   
(C)  $\frac{3}{2} \cdot \frac{1}{(a-b)} [(x+a)^{3/2} + (x+b)^{3/2}] + c$  (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)  $2 \sin x + \log |(\sec x - \tan x)| + c$  (B)  $2 \sin x - \log |(\sec x - \tan x)| + c$   
 (C)  $2 \sin x + \log |(\sec x + \tan x)| + c$  (D)  $2 \sin x - \log |(\sec x + \tan x)| + c$
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)  $\cos x$  (D)  $\sin x$
17. The value of the integral  $\int e^{\sin^2 x} (\cos x + \cos^3 x) \sin x \, dx$  is

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(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