MATHEMATICS (ASSIGNMENT-3)
TOPIC- INDEFINITE INTEGRATION

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

a) $\log(e^{2x}+1)-\tan^{-1}(e^x)+C$

b) $\frac{1}{2}\log(e^{2x}+1)-\tan^{-1}(e^x)+C$

c) $\frac{1}{2}\log(e^{2x}+1)-2\tan^{-1}(e^x)+C$

d) None of these

2. $\int \sqrt{1+\sin\left(\frac{x}{4}\right)}\,dx$ is equal to

a) $8\left(\sin\frac{x}{8}+\cos\frac{x}{8}\right)+c$

b) $8\left(\sin\frac{x}{8}-\cos\frac{x}{8}\right)+c$

c) $8\left(\cos\frac{x}{8}-\sin\frac{x}{8}\right)+c$

d) $\frac{1}{8}\left(\sin\frac{x}{8}-\cos\frac{x}{8}\right)+c$

3. The antiderivative of $\frac{3^x}{\sqrt{1-9^x}}$ with respect to x is

a) $(\log_3 e)\sin^{-1}(3^x)+C$

b) $\sin^{-1}(3^x)+C$

c) $(\log_3 e)\cos^{-1}(3^x)$

d) None of these

4. If $\int \frac{dx}{x\log x}=f(x)+\text{constant}$, then $f(x)$ is equal to

a) $1/\log x$ b) $\log x$ c) $\log\log x$ d) $x/\log x$

5. The value of $\int \frac{x^2+1}{x^2-1}\,dx$ is

a) $\log\left(\frac{x-1}{x+1}\right)+c$

b) $\log\left(\frac{x+1}{x-1}\right)+c$

c) $x+\log\left(\frac{x-1}{x+1}\right)+c$

d) $\log(x^2-1)+c$

6. $\int \frac{x+\sin x}{1+\cos x} dx$ is equal to

a) $x \tan\frac{x}{2} + C$ b) $\cot\frac{x}{2} + C$ c) $\log(1+\cos x) + C$ d) $\log(x+\sin x)$

7. $\int \frac{dx}{1-\cos x-\sin x}$ is equal to

a) $\log\left|1+\cot\frac{x}{2}\right| + c$ b) $\log\left|1-\tan\frac{x}{2}\right| + c$ c) $\log\left|1-\cot\frac{x}{2}\right| + c$ d) $\log\left|1+\tan\frac{x}{2}\right| + c$

8. If $f(x) = \frac{\sin^{-1}x}{\sqrt{1-x^2}}$ and $g(x) = e^{\sin^{-1}x}$, then $\int f(x)g(x)dx$ is equal to

a) $e^{\sin^{-1}x}(\sin^{-1}x - 1) + c$ b) $e^{\sin^{-1}x} + c$

c) $e^{(\sin^{-1}x)^2} + c$ d) $e^{2\sin^{-1}x} + c$

9. If $I = \int \frac{x^5}{\sqrt{1+x^3}} dx$, then I is equal to

a) $\frac{2}{9}(1+x^3)^{\frac{5}{2}} + \frac{2}{3}(1+x^3)^{\frac{3}{2}} + c$ b) $\log\left|\sqrt{x}+\sqrt{1+x^3}\right| + c$

c) $\log\left|\sqrt{x}-\sqrt{1-x^3}\right| + c$ d) $\frac{2}{9}(1+x^3)^{\frac{3}{2}} - \frac{2}{3}(1+x^3)^{\frac{1}{2}} + c$

10. $\int \frac{(\sin\theta+\cos\theta)}{\sqrt{\sin 2\theta}} d\theta$ is equal to

a) $\log|\cos\theta - \sin\theta + \sqrt{\sin 2\theta}| + c$ b) $\log|\sin\theta - \cos\theta + \sqrt{\sin 2\theta}| + c$

c) $\sin^{-1}(\sin\theta - \cos\theta) + c$ d) $\sin^{-1}(\sin\theta + \cos\theta) + c$

11. $\int \operatorname{cosec}^4 x\, dx$ is equal to

a) $\cot x + \frac{\cot^3 x}{3} + c$ b) $\tan x + \frac{\tan^3 x}{3} + c$ c) $-\cot x - \frac{\cot^3 x}{3} + c$ d) $-\tan x - \frac{\tan^3 x}{3} + c$

12. The value of $\int e^{\tan^{-1}x} . \frac{(1+x+x^2)}{1+x^2} dx$ is

a) $\tan^{-1}x + c$ b) $e^{\tan^{-1}x} + 2x + c$ c) $e^{\tan^{-1}x} + c$ d) $xe^{\tan^{-1}x} + c$

13. $\int(\sin x - \cos x)^4(\sin x + \cos x)dx$ is equal to

a) $\frac{\sin x - \cos x}{5} + c$ b) $\frac{(\sin x - \cos x)^5}{5} + c$ c) $\frac{(\sin x - \cos x)^4}{4} + c$ d) $\frac{(\sin x + \cos x)^5}{5} + c$

14. The value of $\int \frac{d(\sin x)}{\sqrt{1-\sin^2 x}}$ is equal to

a) $x + c$ b) $3x + c$ c) $x^2 + c$ d) None of these

15. $\int \frac{dx}{2\sqrt{x}(1+x)}$ is equal to

a) $\frac{1}{2}\tan^{-1}(\sqrt{x})+c$ b) $\tan^{-1}(\sqrt{x})+c$ c) $2\tan^{-1}(\sqrt{x})+c$ d) None of these

16. $\int \frac{\cos x-1}{\sin x+1} e^x\, dx$ is equal to

a) $\frac{e^x \cos x}{1+\sin x}+c$ b) $c-\frac{e^x \sin x}{1+\sin x}$ c) $c-\frac{e^x}{1+\sin x}$ d) $c-\frac{e^x \cos x}{1+\sin x}$

17. If $\int (\log x)^2\, dx = x[f(x)]^2 + Ax[f(x)-1]+c$, then

a) $f(x)=\log x, A=2$ b) $f(x)=\log x, A=-2$

c) $f(x)=-\log x, A=2$ d) $f(x)=-\log x, A=-2$

18. The value of the integral $\int \frac{1+x^2}{1+x^4} dx$ is equal to

a) $\tan^{-1} x^2 + C$

b) $\frac{1}{\sqrt{2}}\tan^{-1}\left(\frac{x^2-1}{\sqrt{2}x}\right)$

c) $\frac{1}{2\sqrt{2}}\log\left(\frac{x^2+\sqrt{2}x+1}{x^2-\sqrt{2}x+1}\right)+C$

d) None of these

19. If $\int \cos^4 x\, dx = Ax + B\sin 2x + C\sin 4x + D$, then $\{A, B, C\}$ equals

a) $\left\{\frac{3}{8},\frac{1}{32},\frac{1}{4}\right\}$ b) $\left\{\frac{3}{8},\frac{1}{4},\frac{1}{32}\right\}$ c) $\left\{\frac{1}{32},\frac{1}{4},\frac{3}{8}\right\}$ d) $\left\{\frac{1}{4},\frac{3}{8},\frac{1}{32}\right\}$

20. $\int \sin^3 x \cdot \cos^2 x\, dx$ is equal to

a) $\frac{\sin^5 x}{5}-\frac{\sin^3 x}{3}+c$ b) $\frac{\sin^5 x}{5}+\frac{\sin^3 x}{3}+c$

c) $\frac{\cos^5 x}{5}-\frac{\cos^3 x}{3}+c$ d) $\frac{\cos^5 x}{5}+\frac{\cos^3 x}{3}+c$

ANSWER- KEY

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