Q.1 $\int \frac{x^5}{1+x^{12}}\,dx$ **is equal to-**

(A) $\tan^{-1}x^6 + c$ **(B)** $2\tan^{-1}x^6 + c$

(C) $\frac{1}{6}\tan^{-1}x^6 + c$ **(D) None of these**

Q.2 $\int \sin\sqrt{x}\,dx$ **is equal to-**

(A) $2(\sin\sqrt{x} - \cos\sqrt{x}) + c$

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

(C) $2(\sin\sqrt{x} - \sqrt{x}\cos\sqrt{x}) + c$

(D) $2(\sin\sqrt{x} + \sqrt{x}\cos\sqrt{x}) + c$

Q.3 $\int \frac{dx}{x + x\log x}$ **is equal to-**

(A) log x + log (log x) + c

(B) log log (1+ log x) + c

(C) log (1+ log x) + c

(D) None of these

Q.4 $\int e^{x/2}\sin\left(\frac{x}{2}+\frac{\pi}{4}\right)dx$ **is equal to-**

(A) $e^{x/2}\sin x/2 + c$ **(B)** $e^{x/2}\cos x/2 + c$

(C) $\sqrt{2}\,e^{x/2}\sin x/2 + c$ **(D)** $\sqrt{2}\,e^{x/2}\cos x/2 + c$

Q.5 $\int \{\sin(\log x)+\cos(\log x)\}\,dx$ **is equal to-**

(A) sin (logx) + c **(B) cos (log x) + c**

(C) x sin (log x) + c **(D) x cos (log x) + c**

Q.6 $\int \log_{10} x\,dx$ **is equal to-**

(A) $\log_{10} x + c$

(B) $x \log_{10} x + c$

(C) $x(\log_{10} x + \log_{10} e) + c$

(D) $x(\log_{10} x - \log_{10} e) + c$

Q.7 $\int [(\log 2x)/x]\,dx$ **equals-**

(A) x log 2x + c

(B) (log x log 2x)/2 + c

(C) (log x log 4 x) /2 + c

(D) None of these

Q.8 $\int \sqrt{\frac{x}{a^3 - x^3}}\,dx$ **is equal to-**

(A) $\sin^{-1}\left(\frac{x}{a}\right)^{3/2} + c$ **(B)** $\frac{2}{3}\sin^{-1}\left(\frac{x}{a}\right)^{3/2} + c$

(C) $\frac{3}{2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2} + c$ **(D)** $\frac{3}{2}\sin^{-1}\left(\frac{x}{a}\right)^{2/3} + c$

Q.9 $\int \frac{dx}{\sin(x-a)\cos(x-b)}$ **is equal to-**

(A) $\cos(a-b)\log\frac{\sin(x-a)}{\cos(x-b)} + c$

(B) $\sec(a-b)\log\frac{\sin(x-a)}{\cos(x-b)} + c$

(C) $\sin(a-b)\log\frac{\cos(x-a)}{\sin(x-b)} + c$

(D) $\text{cosec}(a-b)\log\frac{\cos(x-a)}{\sin(x-b)} + c$

Q.10 $\int x\cos^2 x\,dx$ **is equal to-**

(A) $\frac{x^2}{4} - \frac{1}{4}x\sin 2x - \frac{1}{8}\cos 2x + c$

(B) $\frac{x^2}{4} - \frac{1}{4}x\sin 2x + \frac{1}{8}\cos 2x + c$

(C) $\frac{x^2}{4} + \frac{1}{4}x\sin 2x - \frac{1}{8}\cos 2x + c$

(D) $\frac{x^2}{4} + \frac{1}{4}x\sin 2x + \frac{1}{8}\cos 2x + c$

Q.11 $\int x^{51}(\tan^{-1}x + \cot^{-1}x)\,dx$ **is equal to-**

(A) $\frac{x^{52}}{52}(\tan^{-1}x + \cot^{-1}x) + c$

(B) $\frac{x^{52}}{52}(\tan^{-1}x - \cot^{-1}x) + c$

(C) $\frac{x^{52}}{52} + \frac{\pi}{2} + c$

(D) $-\frac{\pi x^{52}}{104} + \frac{\pi}{2} + c$

Q.12 $\int \frac{\sin^8 x - \cos^8 x}{1 - 2\sin^2 x \cos^2 x}$ dx is equal to-

(A) sin 2x + c **(B)** $-\frac{1}{2}$ sin 2x + c

(C) $\frac{1}{2}$ sin 2x + c **(D)** – sin 2x + c

Q.13 If $\int f(x)\,dx = F(x)$, then $\int x^3 f(x^2)\,dx$ equals

(A) $\frac{1}{2}\left[x^2\ F(x^2) - \int F(x^2)\,dx^2\right]$

(B) $\frac{1}{2}\left[x^2\ F(x^2) - \int F(x^2)\,dx\right]$

(C) $\frac{1}{2}\left[x^2\ F(x) - \frac{1}{2}\int F(x^2)\,dx\right]$

(D) none of these

Q.14 If $I = \int e^x \sin 2x\,dx$, then for what value of k, $kI = e^x(\sin 2x - 2\cos 2x)$ + constant-

(A) 1 **(B) 3** **(C) 5** **(D) 7**

Q.15 $\int \frac{\cos 4x + 1}{\cot x - \tan x}$ dx equals-

(A) $-\frac{1}{2}$ cos 4x + c **(B)** $-\frac{1}{2}$ cos 4x + c

(C) $-\frac{1}{8}$ cos 4x + c **(D) None of these**

Q.16 $\int \frac{x^2 + 1}{(x+1)^2} e^x$ dx equal to-

(A) $\frac{x-1}{x+1} e^x$ + c **(B)** $\frac{x+1}{x-1} e^x$ + c

(C) $\frac{x}{(x+1)^2} e^x$ + c **(D)** $\frac{x}{x+1} e^x$ + c

Q.17 $\int \frac{3\tan\frac{x}{3} - \tan^3\frac{x}{3}}{1 - 3\tan^2\frac{x}{3}}$ dx is equal to-

(A) –log |sec x| + c

(B) – log |(cos x)| + c

(C) $\sec^2 x + c$

(D) log |tan x| + c

Q.18 $\int \cos^3 x \, e^{\log(\sin x)}$ dx is equal to-

(A) $\frac{1}{4} e^{\sin x} + c$ **(B)** $-\frac{1}{4} \sin^4 x + c$

(C) $-\frac{1}{4} \cos^4 x + c$ **(D)** None of these

Q.19 $\int e^{\tan^{-1} x}\left(\frac{1+x+x^2}{1+x^2}\right)$ dx is equal to-

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

(C) $\frac{1}{x} e^{\tan^{-1} x} + c$ **(D)** None of these

Q.20 $\int \sqrt{\frac{\cos x - \cos^3 x}{1 - \cos^3 x}}$ dx is equal to-

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

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

(C) $\frac{2}{3} \cos^{-1}(\cos^{3/2} x) + c$

(D) None of these

Q.21 If $\int \frac{dx}{x\sqrt{1-x^3}} = a \log\left[\frac{\sqrt{1-x^3}-1}{\sqrt{1-x^3}+1}\right] + b$, then-

(A) $a = \frac{1}{3}$ **(B)** $a = \frac{2}{3}$

(C) $a = -\frac{1}{3}$ **(D)** $a = -\frac{2}{3}$

Q.22 $\int \frac{x \tan^{-1} x}{(1+x^2)^{3/2}} dx$ equals to-

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

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

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

(D) None of these

Q.23 $\int \frac{3\cos x + 2\sin x}{4\sin x + 5\cos x} dx$ is equal to-

(A) $\frac{23}{41}x + \frac{2}{41}\log(4\sin x + 5\cos x) + c$

(B) $\frac{23}{41}x - \frac{2}{41}\log(4\sin x + 5\cos x) + c$

(C) $\frac{23}{41}x - \frac{2}{41}\log(4\sin x - 5\cos x) + c$

(D) None of these

Q.24 $\int \frac{x^2+1}{x(x^2-1)}$ dx is equal to-

(A) $\log\left(\frac{x^2-1}{x}\right)$ + c **(B)** – $\log\left(\frac{x^2-1}{x}\right)$ + c

(C) $\log\left(\frac{x}{x^2+1}\right)$ + c **(D)** – $\log\left(\frac{x}{x^2+1}\right)$ + c

Q.25 $\int x^n \log x\, dx$ equals-

(A) $\frac{x^{n+1}}{n+1}\left\{\log x + \frac{1}{n+1}\right\}$ + c

(B) $\frac{x^{n+1}}{n+1}\left\{\log x + \frac{2}{n+1}\right\}$

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

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

Q.26 $\int \tan^{-1}(\sec x + \tan x)\, dx$ equals-

(A) $\frac{x}{2}$ + c **(B)** $\frac{\sec x}{\sec x + \tan x}$ + c

(C) $\frac{x}{4}(\pi + x)$ + c **(D) None of these**

Q.27 $\int \frac{4x-7}{x^2+x-2}$ dx equals-

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

(B) 2 log $(x^2 + x - 2)$ + 3 log $\left(\frac{x-1}{x+2}\right)$ + c

(C) 3 log $(x^2 + x - 2)$ + 2 log $\left(\frac{x-1}{x+2}\right)$ + c

(D) None of these

Q.28 $\int \cos^2 (ax + b) \sin (ax + b)\, dx$ **equals-**

(A) $-\frac{\cos^3(ax+b)}{3a}$ **+ c**

(B) $\frac{\cos^3(ax+b)}{3a}$ **+ c**

(C) $\frac{\sin^3(ax+b)}{3a}$ **+ c**

(D) $-\frac{\sin^3(ax+b)}{3a}$ **+ c**

Q.29 $\int \sqrt{1+\sec x}\, dx$ **equals-**

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

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

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

(D) None of these

Q.30 $\int \frac{\sin x}{\sin 3x} dx$ **is equal to-**

(A) $\frac{1}{2\sqrt{3}} \log\left(\frac{\sqrt{3}+\tan x}{\sqrt{3}-\tan x}\right) + c$

(B) $\frac{1}{2\sqrt{3}} \log\left(\frac{\sqrt{3}-\tan x}{\sqrt{3}+\tan x}\right) + c$

(C) $\frac{1}{\sqrt{3}} \log\left(\frac{\sqrt{3}+\tan x}{\sqrt{3}-\tan x}\right) + c$

(D) None of these

ANSWER KEY

Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ans.	C	C	C	C	C	D	C	B	B	D
Que.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.	A	B	A	C	C	A	B	C	A	C
Que.	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Ans.	A	B	A	A	D	C	A	A	A	A