CHAPTER-7
INTEGRALS
01 MARK TYPE QUESTIONS

Q. NO	QUESTION	MARK
1.	$\int \quad tan^{-1}\sqrt{x}$ dx is equal to a)(x+1)$tan^{-1}\sqrt{x} - \sqrt{x}$ + C (b) x $tan^{-1}\sqrt{x} - \sqrt{x}$ + C (c) $\sqrt{x} -$ x $tan^{-1}\sqrt{x}$ + C (d)) $\sqrt{x} -$ (x+1)$tan^{-1}\sqrt{x}$ + C	1
2.	$\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \quad sec^2x\,dx$ is equal to a)-1 (b) 0 (c) 1 (d) 2	1
3.	$\int \quad \frac{e^x\,(1+x)}{cos^2\,(xe^x)}$ dx is equal to a)tan (xe^x) + C (b) cot (xe^x) + C (c) cot (e^x) + C (d) tan [e^x (1+ x)] + C	1
4.	$\int \quad \frac{dx}{sin^2x cos^2x}$ is equal to a)tanx + cotx + C (b) $(tan\,tan\,x + cotx\,)^2$+ C (c) tanx − cotx + C (d) $(tan\,tan\,x\ - cotx\,)^2$+ C	1
5.	If $\int \quad \frac{3e^x - 5e^{-x}}{4e^x + 5e^{-x}}$ dx = ax + b log $\lvert 4e^x + 5\,e^{-x}\rvert$ + C , then a)a = $\frac{-1}{8}$, b = $\frac{7}{8}$ (b) a = $\frac{1}{8}$, b = $\frac{7}{8}$ (c) a = $\frac{-1}{8}$, b = $\frac{-7}{8}$ (d) a = $\frac{1}{8}$, b = $\frac{-7}{8}$	1
6.	$\int_0^{\frac{\pi}{8}} \quad tan^2(\,2x\,)$ dx is equal to a)$\frac{4-\pi}{8}$ (b)$\frac{4+\pi}{8}$ (c) $\frac{4-\pi}{4}$ (d) $\frac{4-\pi}{2}$	1
7.	$\int_{-1}^{1} \quad \frac{x^3 + \lvert x\rvert + 1}{x^2 + 2\lvert x\rvert + 1}$ dx is equal to a)log2 (b) 2 log2 (c) $\frac{1}{2}$ log2 (d) 4 log2	1
8.	$\int_{-2}^{2} \quad \lvert x\,cos\pi x\rvert$ dx is equal to a)$\frac{8}{\pi}$ (b) $\frac{4}{\pi}$ (c) $\frac{2}{\pi}$ (d) $\frac{1}{\pi}$	1
9.	$\int_0^{\frac{\pi}{6}} \quad sec^2\,(\,x - \frac{\pi}{6}\,)$dx is equal to a)$\frac{1}{\sqrt{3}}$ (b) $-\frac{1}{\sqrt{3}}$ (c) $\sqrt{3}$ (d) $-\sqrt{3}$	1
10.	If $\frac{d}{dx}$ [f(x)] = ax + b and f(0) = 0 , then f(x) is equal to a)a+b (b) $\frac{ax^2}{2}$ + bx (c) $\frac{ax^2}{2}$ + bx +C (d) b	1
11.	$If\ I = \int \frac{Sin^2x - Cos^2x}{Sin^2x\ Cos^2x} dx, then\ value\ of\ I\ will\ be.$ (a) $\tan x + \cos x + c$ (b) $\tan x + \mathrm{cosec}\,x + c$ (c) $\tan x + \cot x + c$ (d) $\tan x + \sec x + c$	1

12.	$\int \frac{dx}{1+\cos 2x}$ *is equal to,* $(a)\ \tan x + c$ $\quad\quad$ $(b)\ \frac{1}{2}\tan x + c$ $(c) 2\tan x + c$ $\quad\quad$ (d) *none of these*	1
13.	$\int_{-2}^{2} \lvert x\rvert\, dx$ *is equals to,* $(a)\ 0$ $\quad$ $(b) 2$ $\quad$ $(c)\ 4$ $\quad$ $(d)\ 1$	1
14.	$\frac{d}{dx}\int f(x)\, dx$ *is equals to,* $(a)\ f'(x)$ $\quad$ $(b)\ f(x)$ $\quad$ $(c)\ f(x')$ $\quad$ $(d)\ f'(x')$	1
15.	*What is the value of* $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\tan x}}{\sqrt{\tan x}+\sqrt{\cot x}} dx$ $(a)\ \frac{\pi}{2}$ $\quad$ $(b) \frac{\pi}{4}$ $\quad$ $(c)\ \frac{\pi}{8}$ $\quad$ $(d) \frac{\pi}{12}$	1
16.	*What is the value of* $\int_1^e \left(\frac{1+\log x}{x}\right) dx$ $(a)\ \frac{3}{2}$ $\quad$ $(b) \frac{1}{2}$ $\quad$ $(c)\ e$ $\quad$ $(d) \frac{1}{e}$	1
17.	*What is the value of* $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} sin^9 x\, dx$ $(a)\ 0$ $\quad$ $(b) 1$ $\quad$ $(c) -1$ $\quad$ $(d)\ 2$	1
18.	Value of $\int_0^1 \left(\frac{x}{1+x}\right)$ dx is $(a) 1 - \log 2$ $\quad\quad$ $(b)\ \log 2 - 1$ $(c) 1 + \log 2$ $\quad\quad$ $(d)\ \log 2$	1
19.	**Assertion (A):** $\int \frac{dx}{x^2+2x+3} = \frac{1}{\sqrt{2}}\tan^{-1}\left(\frac{x+1}{2}\right) + c$ **Reason (R):** $\int \frac{dx}{x^2+a^2} = \frac{1}{a}\tan^{-1}\left(\frac{x}{a}\right) + c$ (a) Both A and R are true and R is correct explanation of A (b) Both A and R are true but R is NOT the correct explanation of A (c) A is true but R is false (d) A is false and R is True	1
20.	**Assertion (A):** $\int e^x[\sin x + \cos x]dx = e^x \sin x + c$ **Reason (R):** $\int e^x [f(x) + f'(x)]dx = e^x f(x) + c$	1

	(a) Both A and R are true and R is correct explanation of A (b) Both A and R are true but R is NOT the correct explanation of A (c) A is true but R is false (d) A is false and R is True	
21.	If $\frac{d}{dx}\left(f(x)\right) = 5x^4 - \frac{4}{x^5}$ *such that* $f(2) = 0$. Then $f(x)$ is (a) $x^5 + \frac{1}{x^4} - \frac{129}{8}$ (b) $x^5 + \frac{1}{x^4} + \frac{129}{8}$ (c) $x^5 + \frac{1}{x^4} - \frac{513}{16}$ $x^5 + \frac{1}{x^4} + \frac{513}{16}$	1
22.	$\int \frac{1}{sin^2xcos^2x}dx$ equals (a) tanx + cotx +C (b) tanx - cotx +C (c) tanx cotx +C (d) tanx – cot2x +C	1
23.	$\int \frac{1}{x(x^3+1)}dx$ equals (a) $\frac{1}{3} log\ log \left\|\frac{x^3}{x^3-1}\right\| + C$ (b) $\frac{1}{3} log\ log \left\|\frac{x^3+1}{x^3}\right\| + C$ (c) $\frac{1}{3} log\ log \left\|\frac{x^3}{x^3+1}\right\| + C$ (d) $\frac{1}{3} log\ log \left\|\frac{x^3-1}{x^3}\right\| + C$	1
24.	$\int \frac{5x^4 + 5^x 5\ 1}{x^5 + 5^x}dx$ equals (a) $5^x - x^5 + C$ (b) $5^x + x^5 + C$ (c) $(5^x - x^5)^{-1} + C$ (d) $log(5^x + x^5) + C$	1
25.	$\int e^x\, sec\ sec\ x(1 + tanx)dx\ equals$ (a) $e^x cosx + C$ (b) $e^x secx + C$ (c) $e^x sinx + C$ (d) $e^x tanx + C$	1
26.	$\int \frac{cos2x - cos2\theta}{cosx - cos\theta}dx\ is\ equal\ to$ (a) $2(sinx + xcos\theta) + C$	1

	(b) $2(sinx - xcos\theta) + C$ (c) $2(sinx + 2xcos\theta) + C$ (d) $2(sinx - 2xcos\theta) + C$	
27.	$\int_0^{2/3} \frac{1}{4+9x^2} dx \; is \; equal \; to$ (a) $\frac{\pi}{6}$ (b) $\frac{\pi}{12}$ (c) $\frac{\pi}{24}$ (d) $\frac{\pi}{4}$	1
28.	$\int_{-1}^{1} \frac{\|x-2\|}{x-2} dx, x \neq 2$ is equal to (a) 1 (b) -1 (c) 2 (d) -2	1
29.	$The \; value \; of \; the \; integral \int_0^{\frac{\pi}{2}} log \; log \left(\frac{4+3sinx}{4+3cosx}\right) dx \; is$ (a) 2 (b) ¾ (c) 0 (d) -2	1
30.	$\int_{a+c}^{b+c} f(x)dx \; is \; equal \; to$ (a) $\int_a^b f(x-c)dx$ (b) $\int_a^b f(x+c)dx$ (c) $\int_a^b f(x)dx$ (d) $\int_{a-c}^{b-c} f(x)dx$	1
31.	Anti derivative of $sin \; sin \; (ax+b)$ is (a) $cos \; cos \; (ax+b) + c$ (b) $a \; cos \; cos \; (ax+b) + c$ (c) $-\frac{coscos \; (ax+b)}{a} + c$ (d) $-\frac{coscos \; (ax+b)}{b} + c$	1
32.	$\int e^{2x} dx =$ $(a)e^x + c$ (b) $\frac{e^{2x}}{2} + c$ (c) $x^2 + c$ (d) $\frac{x^3}{3} + c$	1
33.	$\int cos \; cos \; \frac{7\pi}{6}) dx =$ (a)$\frac{7\pi}{6}x + c$ (b) $\frac{5\pi}{6}x + c$ (c) $\frac{\pi}{6}x + c$ (d) $\frac{\pi}{3}x + c$	1
34.	$\int e^{(sinx)^2} sin2xdx =$	1

	$(a)(sin\ sin\ x)^2+c$ (b) $e^{(cosx)^2}+c$ (c) $e^{(sinx)^2}+c$ (d) none of these	
35.	$$\int_0^{2\pi} \frac{e^{sinx}}{e^{sinx}+e^{-sinx}}dx=$$ (a)0 (b) π (iii) 2π (iv) $\frac{\pi}{2}$	1
36.	$$\int_{\frac{-\pi}{4}}^{\frac{\pi}{4}} x^3(sinx)^4dx=$$ $(a)0$ (b) 1 (c) $\frac{\pi}{4}$ (d) $\frac{\pi}{2}$	1
37.	$$\int e^x\left(\frac{1}{x}-\frac{1}{x^2}\right)dx$$ (a) e^x+c (b) $\frac{e^x}{x}+c$ (c) $\frac{e^x}{x^2}+c$ (d) none of these	1
38.	$$\int (e^x+1)^2e^xdx$$ (a) e^x+1+c (b) $(e^x+1)^2+c$ (c) $\frac{(e^x+1)^3}{3}+c$ (d) $e^{2x}+c$	1
39.	$\int_0^3 [x]dx=$, where $[x]$ means the greatest integer less than or equal to x. (a) 0 (b) 3 (c) 2 (d) 1	1
40.	$$\int xd(x^2+2)$$ (a) $\frac{x^2}{2}+c$ (b) $x+c$ (c) $\frac{2x^3}{3}+c$ (d) $\frac{x^4}{4}+c$	1
41.	$\int 2^x3^xdx$ is equal to (a) $\frac{2^x}{ln2}+C$ (b) $\frac{3^x}{ln3}+C$ (c) $\frac{2^x3^x}{ln2\ ln3}+C$ (d) $\frac{6^x}{ln6}+C$	1
42.	If $\int \frac{\sqrt{cotx}}{sinx\ cosx}dx=A\sqrt{cotx}+K$, then the value of A is __ (a)2 (b) 1 (c) -2 (d) -1	1
43.	The anti – derivative of $\int \frac{sin^2x}{cos^4x}dx$is (a) a polynomial of degree 5 in $sinx$ (b) a polynomial of degree 4 in $tanx$ (c) a polynomial of degree 5 in $tanx$ (d) a polynomial of degree x in $cosx$	1
44.	$\int \frac{x^9}{(4x^2+1)^6}dx$ is equal to (a)$\frac{1}{5x}\left(4+\frac{1}{x^2}\right)^{-5}+C$ (c)$\frac{1}{5}\left(4+\frac{1}{x^2}\right)^{-5}+C$ (b)$\frac{1}{10}\left(4+\frac{1}{x}\right)^{-5}+C$ (d)$\frac{1}{10}\left(4+\frac{1}{x^2}\right)^{-5}+C$	1
45.	$\int \frac{dx}{x(x^n-1)}$ is equal to	1

	(a) $\frac{1}{n}log\left\|1-\frac{1}{x^n}\right\|+C$ (c) $\frac{1}{n}log\left\|\frac{x^n}{x^n-1}\right\|+C$ (b) $\frac{1}{x^n}log\left\|\frac{x^n}{x^n-1}\right\|+C$ (d) $\frac{1}{x^n}log\left\|\frac{x^n-1}{x^n}\right\|+C$	
46.	$\int\frac{3e^x-5e^x}{4e^x+5e^x}dx=Px+Qlog\|4e^x+5e^x\|+Constant$, then (a) $P=\frac{-1}{8},\ Q=\frac{-7}{8}$ (c) $P=\frac{1}{8},\ Q=\frac{7}{8}$ (b) $P=\frac{-1}{8},\ Q=\frac{7}{8}$ (d) $P=\frac{1}{8},\ Q=\frac{-7}{8}$	1
47.	The value of $\int_{-2}^{3}\|1-x^2\|\,dx$ is (a) $\frac{1}{3}$ (b) $\frac{14}{3}$ (c) $\frac{7}{3}$ (d) $\frac{28}{3}$	1
48.	If $\int_0^{\pi}xf(sinx)dx=A\int_0^{\frac{\pi}{2}}f(sinx)dx$, then A is (a) 2π (b) π (c) $\frac{\pi}{2}$ (d) 0	1
49.	$\int_0^{\pi}\|sinx\|\,dx$ is (a) 2 (b) 2π (c) π (d) 0	1
50.	$\int_0^{2}[x^2]\,dx$ is (a) $2-\sqrt{2}$ (b) $2-\sqrt{2}$ (c) $\sqrt{2}-1$ (d) $-\sqrt{2}-\sqrt{3}+5$	1

ANSWERS:

Q. NO	ANSWER	MARKS
1.	a)(x+1)$tan^{-1}\sqrt{x} - \sqrt{x}$ + C let I = $\int tan^{-1}\sqrt{x}$ dx ,put $\sqrt{x}$ = t , ⇒ $\frac{1}{2\sqrt{x}}$ dx = dt , ⇒dx = 2$\sqrt{x}$ dt ⇒2t dt so, I = $\int tan^{-1}t\ 2t\ dt$ = $tan^{-1}t\ 2\frac{t^2}{2} - \int \frac{1}{1+t^2} . 2\frac{t^2}{2}$dt (integrating by parts) =$t^2\ tan^{-1}t - \int \frac{1}{1+t^2} . \frac{t^2}{}$dt = $t^2\ tan^{-1}t - \int \frac{1+t^2-1}{1+t^2}$ dt = $t^2\ tan^{-1}t - \int (1 - \frac{1}{1+t^2})$ dt = $t^2\ tan^{-1}t$ – [t - $tan^{-1}t$]= $t^2\ tan^{-1}t$ - t + $tan^{-1}t$ = $tan^{-1}t\ (t^2$ +1) – t = (x+1) $tan^{-1}\sqrt{x}$ – $\sqrt{x}$ + C	1
2.	(d) 2 We have $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} sec^2x\ dx$ = $[tanx]_{-\frac{\pi}{4}}^{\frac{\pi}{4}}$ = tan $\frac{\pi}{4}$ - tan (- $\frac{\pi}{4}$) = 1 + 1 =2	1
3.	a)tan (xe^x) + C let I = $\int \frac{e^x\ (1+x)}{cos^2\ (xe^x)}$ dx , put xe^x = t ⇒ (xe^x+ e^x) dx = dt ⇒ e^x (x+1) dx = dt So , I = $\int \frac{dt}{cos^2t}$ = $\int sec^2t$ dt = tant + C = tan (xe^x) + C	1
4.	(c) tanx − cotx + C I = $\int \frac{dx}{sin^2xcos^2x}$ = $\int \frac{sin^2x+cos^2x}{sin^2xcos^2x}$dx = $\int sec^2x$ dx + $\int cosec^2x$ dx = tanx − cotx + C	1
5.	a)a = $\frac{-1}{8}$, b = $\frac{7}{8}$	1
6.	a)$\frac{4-\pi}{8}$ $\int_0^{\frac{\pi}{8}} tan^2(\ 2x\ )$ dx = $\int_0^{\frac{\pi}{8}} sec^2 2x\ - 1$ dx =$[\frac{tantan\ 2x}{2} - x\ ]_0^{\frac{\pi}{8}}$ = $\frac{tan\frac{\pi}{4}}{2} - \frac{\pi}{8}$ – 0 = $\frac{1}{2} - \frac{\pi}{8}$ = $\frac{4-\pi}{8}$	1
7.	(b) 2 log2 I = $\int_{-1}^{1} \frac{x^3+\|x\|+1}{x^2+2\|x\|+1}$ dx = $\int_{-1}^{1} \frac{x^3}{x^2+2\|x\|+1}$dx + $\int_{-1}^{1} \frac{\|x\|+1}{x^2+2\|x\|+1}$dx = 0 + 2 $\int_0^1 \frac{\|x\|+1}{(\|x\|+1)^2}$dx [odd function + even function] = 2 $\int_0^1 \frac{x+1}{(x+1)^2}$dx = 2 $\int_0^1 \frac{1}{x+1}$ dx = 2 $[\ log\ \|x+1\|]_0^1$ = 2 log 2	1
8.	a)$\frac{8}{\pi}$ since I = $\int_{-2}^{2} \|x\ cos\pi x\|$ dx = 2 $\int_0^2 \|x\ cos\pi x\|$ dx = 2 { $\int_0^{\frac{1}{2}} \|x\ cos\pi x\|$dx +	1

	$\int_{\frac{1}{2}}^{\frac{3}{2}} \|x\, cos\pi x\|dx + \int_{\frac{3}{2}}^{2} \|x\, cos\pi x\|dx \} = \frac{8}{\pi}$	
9.	a) $\frac{1}{\sqrt{3}}$ $\int_0^{\frac{\pi}{6}} sec^2\,(x - \frac{\pi}{6})dx = [\,tan\, tan\left(x - \frac{\pi}{6}\right)_0^{\frac{\pi}{6}}$ = tan ($\frac{\pi}{6} - \frac{\pi}{6}$) − tan (0 -− $\frac{\pi}{6}$) = tan 0 $-tan\, tan\left(-\frac{\pi}{6}\right)$ = 0 + tan $\frac{\pi}{6} = \frac{1}{\sqrt{3}}$	1
10.	(b) $\frac{ax^2}{2}$ + bx Given , $\frac{d}{dx}$ [f(x)] = ax + b and f(0) = 0 On integrating both sides , we have f(x) = $\int (ax + b\,)dx = \frac{ax^2}{2}$ + bx + C ⇒ f(x)= $\frac{ax^2}{2}$ + bx + C ...... (i) Also , f(0) =0 , we have from (i) f(0) = C ⇒ 0 =C Putting in (i) , we have f(x) = $\frac{ax^2}{2}$ + bx	1
11.	(c)	1
12.	(b)	1
13.	(c)	1
14.	(b)	1
15.	(b)	1
16.	(a)	1
17.	(a)	1
18.	(a)	1
19.	(d)	1
20.	(a)	1
21.	(c)	1
22.	(b)	1
23.	(c)	1
24.	(d)	1
25.	(b)	1
26.	(a)	1
27.	(c)	1
28.	(b)	1
29.	(c)	1
30.	(b)	1
31.	(c)	1
32.	(d)	1
33.	(b)	1
34.	(c)	1
35.	(b)	1
36.	(a)	1
37.	(b)	1
38.	(c)	1

39.	(b)	1
40.	(c)	1
41.	(d) $\frac{6^x}{ln6} + C$	1
42.	(c) -2	1
43.	(c) a polynomial of degree 3 in $tanx$	1
44.	(d)$\frac{1}{10}\left(4+\frac{1}{x^2}\right)^{-5} + C$	1
45.	(a) $\frac{1}{n} log \left\|1-\frac{1}{x^n}\right\| + C$	1
46.	(b) $P = \frac{-1}{8},\ Q = \frac{7}{8}$	1
47.	(d) $\frac{28}{3}$	1
48.	(b)π	1
49.	(a)2	1
50.	(d) $-\sqrt{2}-\sqrt{3}+5$	1