CHAPTER 7

INTEGRALS

TRUE/FALSE TYPE QUESTIONS

Sl.No.	Questions
1.	$\int \frac{x^2}{1+x^2} dx = x + tan^{-1}$x + c
2.	$\int x\sqrt{x+1}$ dx = $\frac{2}{5}(x+1)^{5/2}$ - $\frac{2}{3}(x+1)^{3/2}$+c
3.	$\int \frac{dx}{3-5x}$ = log|3-5x| + c
4.	$\int \frac{cosx-sinx}{cosx+sinx}$dx = $\frac{1}{sinx+cosx}$ + c
5.	$\int cos^3$x dx = sin3x/12 + (3/4) sinx + c
6.	$\int_{-1}^{1} x^{15}$cosx dx = π
7.	$\int_{-1}^{1}(x-[x])$dx = 1
8.	$\int sin^n$x cosx dx = sin^5x/5 + c , then n = 4
9.	$\int \sqrt{(e^x}$-1) dx = 2 √(e^x-1) -2 Tan^{-1}√(e^x-1) + c
10.	$\int \frac{dx}{x-\sqrt{x}}$ = 2log |$\sqrt{x}$ + 1| + c
11.	The value of $\int \frac{1}{\sqrt{16-9x^2}} dx$ is $\frac{1}{3}\sin^{-1}\frac{3x}{4}$ + C
12.	The value of $\int_{-1}^{1} \frac{\|x+2\|}{x+2}$ is 2.
13.	$\int_{-a}^{a} f(x)dx = 2\int_{0}^{a} f(x)dx$, if f(x) is odd function and $\int_{-a}^{a} f(x)dx = 0$, if f(x) is an even function.
14.	The value of $\int_{a}^{b} f(x)dx$ and $\int_{a}^{b} f(t)dt$ are not equal.
15.	The value of $\int_{0}^{\pi} \|\cos x\| dx$ is 2.
16.	If we have g (x) =$\int_{0}^{\pi} cos^4x\, dx$, then g (x+π) ≠ g (x) + g (π).
17.	If $\int_{0}^{a} \frac{1}{1+4x^2} dx = \frac{\pi}{8}$ then the value of a is 1/2.
18.	The value of $\int_{0}^{\pi/4} \sqrt{1+sin2x}$ dx is 1
19.	Derivative of a function is unique but a function can have infinite ant derivatives.

20.	$\int_0^{2a} f(x)dx = 2\int_0^{a} f(x)dx$, if f(2a-x)= f(x) and $\int_0^{2a} f(x)dx = 0, if\ f(2a-x) = -f(x)$
21.	Some continuous functions do not have antiderivatives.
22.	The integral $\int \frac{x}{x-1}dx$ can be evaluated using the substitution $u = x$.
23.	The integral $\int \frac{x}{x^2-1}dx$ can be evaluated using the substitution $u = x^2 - 1$
24.	If $F(x)$ is an ant derivative of $f(x)$, then $f'(x) = F(x)$
25.	$\int e^x(cosx - sinx)dx$ is equal to $e^x \cos x + C$
26.	The anti-derivative F of f defined by f (x) = 4x ^{3} – 6, where F (0) = 3, is F(x) = x ^{4} – 6x + 3
27.	Differentiation is a process involving limits. But integration is not.
28.	The indefinite integral of a function represents geometrically, a family of curves placed parallel to each other having parallel tangents at the points of intersection of the curves of the family with the lines orthogonal (perpendicular) to the axis representing the variable of integration.
29.	When a polynomial function P is integrated, the result is a polynomial whose degree is 1 more than that of P.
30.	The process of differentiation and integration are inverses of each other
31.	$\int \frac{\sec^2 x}{\operatorname{cosec}^2 x}dx = \tan x - x + C$
32.	$\int \cot x \log \sin x\, dx = \frac{1}{2}(\log \sin x)^2 + C$
33.	$\int \frac{1}{\sin^2 x \cos^2 x}dx = \cot x - \operatorname{cosec} x + C$
34.	$\int \frac{1-\cos x}{1+\cos x}dx = 2\tan\frac{x}{2} - x + C$
35.	$\int \frac{\sin^3 x + \cos^3 x}{\sin^2 x \cos^2 x}dx = \sec x + \operatorname{cosec} x + C$
36.	$\int \frac{1}{\sqrt{x^2+2x+2}}dx = \log\left\|(x+1) + \sqrt{x^2+2x+2}\right\| + C$
37.	$\int x^2 e^x\, dx = e^x(x^2 - 2x - 2) + C$
38.	$\int x\sec^2 x\, dx = x\tan x - \log\|\cos x\| + C$

39.	$\int e^x[\operatorname{cosec}^2 x - \cot x]\, dx = -e^x \cot x + C$
40.	$\int \sqrt{1+\frac{x^2}{9}}\, dx = \frac{x}{2}\sqrt{9+x^2} + \frac{9}{2}\log\left\|x+\sqrt{9+x^2}\right\| + C$
41.	$\int sec^2 9x\, dx = tan9x + C$
42.	$\int tanx\, dx = -log\|cosx\| + C$
43.	$\int e^{x^2}\, dx = e^{x^2} + C$
44.	$\int \frac{sec^2 x}{cosec^2 x}\, dx = \frac{tanx}{-cotx} + c$
45.	$\int tanx\, dx = sec^2 x + C$
46.	$\int \frac{dx}{\sqrt{9-4x^2}} = sin^{-1}\frac{2x}{3} + c$
47.	$\int \frac{1}{x^2-9}\, dx = \frac{1}{3}tan^{-1}\frac{x}{3} + C$
48.	$\int tan^2 3x\, dx = tan3x - x + C$
49.	$\int xsec^2 x\, dx = \frac{x^2}{2}\, tanx + C$
50.	$\int logx\, dx = \frac{1}{x} + C$
51.	I = $\int \sqrt{x}$ sinx dx is integrable.
52.	The integration by parts is applicable to the product of functions in all cases.
53.	Integration by substitution method is applicable in trigonometric function only.
54.	Integration is an inverse process of differentiation.
55.	$\frac{d}{dx}$(sinx+c) =Cosx then antiderivatives of the function is unique.
56.	Integral $\int f(x)dx$= x^2 + c are similar in geometrically.
57.	Integral of the type $\int e^x$[f(x) +f'(x)]dx =e^xf(x) + c

58.	Partial fraction is applicable only when degree of numerator < degree of denominator.
59.	Integration of $\int secx$dx = log|tan(π/2+x/2) |+ c
60.	Integration of $\int \frac{1}{x^2-a^2}$ dx =$\frac{1}{2a}$ log|$\frac{x-a}{x+a}$|+c
61.	When a polynomial function P is integrated, the result is a polynomial whose degree is 1 less than P.
62.	If $\frac{d}{dx} f(x) = 4x^3 - \frac{3}{x^4}$ such that f(2) = 0. Then f (x) is $x^4 + \frac{1}{x^3} - \frac{129}{8}$.
63.	The indefinite integral of a function f(x) represents geometrically a family of curves.
64.	The value of $\int cosecx(cosecx + cotx)$dx is – cotx + cosecx + C.
65.	Integral of $\int \frac{e^x}{\sqrt{4- e^{2x}}}$ dx is equal to $\frac{e^x}{2}$) + C.
66.	Integrals of $\int \frac{sec^2x}{1-tan^2x}$ dx is $\frac{1}{2}$ log I $\frac{1+tanx}{1-tantanx}$ I + C
67.	If $\int \frac{3+3\ cosx}{x+sinx} dx$ is $\frac{log\ (x+sinx)}{k}$ + C, then the value of k is 2.
68.	The ant derivative F of f(x) = $4x^3 - 6$, where F(0) = 2 is F(x) = $x^4 - 6x + 2$.
69.	$\int \frac{1}{(x+2)(x^2+1)} dx$ = a logI 1 + x2I+ $\frac{2}{5}$ tan-1x + b logIx +2 I + C, then the value of a = - 1/10, b = 1/5.
70.	To evaluate the integral of the form $\int \frac{dx}{Linear\sqrt{Quadratic}}$, we have to put linear = 1/t.
71.	$\int_a^b f(x)dx = \int_a^b f(a+b-x)\,dx$
72.	$\int_0^{\frac{\pi}{2}} \frac{\sqrt{cotx}}{\sqrt{cotx}+\sqrt{tanx}} dx = \frac{\pi}{2}$
73.	$\int_0^{4\pi} sin^6 x dx = 4\int_0^{\pi} sin^6 x dx.$
74.	$\left\|\int_0^3 (x-2)dx\right\| \geq \int_0^3 \|(x-2)\|\,dx$
75.	$\int_{-1}^{1} x - [x]dx = 0$
76.	$\int_0^{\pi} xf(sinx)dx = \frac{\pi}{2}\int_0^{\pi} f(sinx)dx$
77.	If a is a real number such that $\int_0^a xdx \leq a+4$, then$-2 \leq a \leq 4$

78.	$\int_0^{\frac{\pi}{2}} f(sin2x)sinxdx = \int_0^{\frac{\pi}{2}} f(sin2x)cosxdx$.
79.	If $f and g$ are continuous on $[0, a]$ satisfying $f(a-x) = f(x) and g(x) + g(a-x) = a, then\ show that \int_0^a f(x)g(x)dx = \frac{a}{3}\int_0^a f(x)dx$.
80.	$\int_{-1}^{1} e^{\|x\|}dx$ = 2(e-1).
81.	$\int_a^b f(x)\,dx = -\int_b^a f(t)\,dt$
82.	$\int_a^b f(x)\,dx = \int_a^c f(x)\,dx + \int_c^b f(x)\,dx$ c ∈ [a,b]
83.	$\int_{-a}^{a} f(x)\,dx = 0$ if f(x) is an even function
84.	$\int_0^{\infty} \|x-5\|\,dx$ is equal to 17
85.	$\int_0^1 2^{x-[x]}\,dx$is 0.
86.	The area below the x-axis is negative, in such cases we should take area as $\left\|\int_a^b y\,dx\right\|$.
87.	The area of the ellipse $2x^2 + 3y^2 = 6$ will be more than the area of the circle $x^2 + y^2 - 2x + 4y + 4 = 0$
88.	The area of the region bounded by the parabolas $y^2 = 4ax$ and $x^2 = 4by$ is (16/3)ab.
89.	The area of the parabola $y^2 = 4ax$ bounded by the latus rectum is $8a^2/3$
90.	$\int_0^{\pi} \|cos\,x\|\,dx = 0$
91.	If f is an even function i.e f(-x) = f(x).Then $\int_{-a}^{a} f(x)dx = 2\int_{-a}^{a} f(x)dx$
92.	If f is an odd function. i.e f(-x) = -f(x). then $\int_{-a}^{a} f(x)dx$ =0
93.	$\int_0^a f(x)dx = \int_0^a f(a-x)dx$?
94.	$\int_a^b f(x)dx = -\int_a^b f(x)dx$?
95.	$\int_a^b f(x)dx$ = F(b) – F(a) where F(x) = integral of f(x)
96.	$\int_2^3 x^2dx = \frac{17}{3}$
97.	$\int_0^{\pi/4} \sin 2x$ dx = $\frac{1}{2}$
98.	$\int_{-\pi/4}^{\pi/4} sin^2$ dx =$\frac{\pi}{4}$ -$\frac{1}{2}$

99.	$$\int_{-1}^{2} \lvert x^3 - x \rvert \, dx = \frac{11}{4}$$
100.	The value of $\int_0^1 xe^x$ dx =1
101.	$\int_0^1 e^{x^2} x \ dx = \frac{1}{2}(e-1)$
102.	$\int_0^1 \frac{1}{\sqrt{1-x^2}} \ dx = \pi$
103.	$\int_0^2 \frac{dx}{x+4-x^2} = \log \frac{21+5\sqrt{17}}{4}$
104.	$\int_1^2 \left(\frac{1}{x} - \frac{1}{x^2}\right) e^{2x} dx = \frac{e^2(e^2-2)}{4}$
105.	$\int_0^{\frac{\pi}{2}} sin^3 x \ dx = \frac{2}{3}$
106.	$\int_{-5}^{5} \lvert x+2 \rvert dx$= 29
107.	$\int_0^{\pi} \frac{xsinx \ dx}{1+cos^2 x} = \frac{\pi}{4}$
108.	$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} sin^7 x \ dx = 2\int_0^{\frac{\pi}{2}} sin^7 x \ dx$
109.	$\int_{-1}^{1} \frac{1}{x^2+2x+5} dx = \frac{\pi}{8}$
110.	$\int_0^{\frac{\pi}{2}} \log(\frac{4+3sinx}{4+3cosx}) = 0$
111.	Identify the integrand of $\int_{-1}^{1}(x+1)$ dx is (x+1) -
112.	If $\int_1^a (3x^2+2x+1)$ dx = 11 , then the value of a is 3 -
113.	Let A(x) = $\int_a^x f(x)$ dx for all x ≥ a , where f(x) is a continuous function
114.	$\int_a^b f(x)$ dx defined as the area of the region bounded by the curve, a≤ x≤ b and x – axis
115.	The value of $\int_{-\pi/4}^{\pi/4} (x^3 sin^4 x)$ dx is 0
116.	If f(x) = $\int_0^x t \ sint$ dt then $\frac{df}{dx}$ is cosx
117.	The value of $\int_0^{\pi/2} \frac{cos^2 x}{1+3sin^2 x}$ dx is $\frac{\pi}{6}$
118.	The value of $\int_0^1 \frac{1}{e^x+e^{-x}}$ dx is $\frac{\pi}{4}$

119.	The value of $\int_0^3 x^2\sqrt{3-x}$ dx is $\frac{14}{35}\sqrt{3}$
120.	The value of $\int_0^\pi x\, logsinx$ dx is (- $\frac{\pi^2}{2}$log2)
121.	The value of $\int_1^2 \frac{1}{x(1+logx)^2}dx$ is $\frac{\log 2}{1-\log 2}$
122.	The value of $\int_0^4 3^{\sqrt{2x+1}}\,dx$ is $\frac{81}{\log 3}$
123.	The value of $\int_0^1 x(1-x)^{99}\,dx$ is $\frac{1}{10100}$
124.	The value of $\int_0^{\frac{\pi}{2}} cos^2x\,dx$ is $\frac{\pi}{4}$
125.	The value of $\int_0^{\frac{\pi}{2}} \frac{cosx}{(cos\frac{x}{2}+sin\frac{x}{2})^3}dx$ is $2-\sqrt{2}$
126.	The value of $\int_0^{\frac{\pi}{2}} \frac{sin2x}{sin^4x+cos^4x}dx$ is $\frac{\pi}{2}$
127.	The value of $\int_0^{\frac{\pi}{4}} \sqrt{1-sin2x}\,dx$ is $\sqrt{2}+1$
128.	The value of $\int_0^1 \sin^{-1}(\frac{2x}{1+x^2})\,dx$ is equal to $\frac{\pi}{2}-log2$
129.	The value of $\int_0^{\frac{\pi}{2}} \sqrt{cos\theta}sin^3\theta\,d\theta$ is $\frac{8}{21}$
130.	The value of $\int_0^{\frac{\pi}{2}} \frac{1}{3+2\,cosx}\,dx$ is equal to $\frac{2}{\sqrt{5}}\tan^{-1}(\frac{1}{\sqrt{5}})$
131.	The definite integral has unique value.
132.	The definite integral $\int_{-2}^3 x(x^2-1)^{\frac{1}{2}}\,dx$ is erroneous.
133.	Let f be a continuous function defined on the closed interval [a, b] and F be an anti derivativeof f. Then $\int_a^b f(x)\,dx = f(a)-f(b)$.
134.	$\int_{-a}^a f(x)\,dx = 0$, If f is an even function.
135.	$\int_0^{2a} f(x)\,dx = 0$ iff (2a $-x) = f(x)$ for any number a and for any function f.
136.	If f is a continuous function defined on $[-a,a]$ then $\int_{-a}^a f(x)dx = \int_0^a \{f(x)+f(-x)\}dx$
137.	$\int_0^4 \lvert x-1\rvert\,dx = 5$
138.	$\int_2^4 2^x\,dx = \frac{12}{\log 2}$.
139.	If $I_{10} = \int_0^{\frac{\pi}{2}} x^{10}\sin x\,dx$, then the value of $I_{10}+90I_8$ is $10\,(\frac{\pi}{2})^8$.
140.	If $f(a+b-x)=f(x)$, then $\int_a^b xf(x)dx = \frac{a+b}{2}\int_a^b f(x)dx$

141.	$\int_a^b f(x)dx = \int_b^a f(x)dx$
142.	$\int_a^b f(x)dx = \int_a^c f(x)dx + \int_c^b f(x)dx$, where $a < c < b$.
143.	$\int_1^2 f(x)dx = 3$, then $\int_1^2 4\, f(x)dx = 10$
144.	$\int_0^3 g(x)dx = -5, \quad then \int_3^0 2\, g(x)dx = -9$
145.	$\int_2^4 g(x)dx = 12 \; and \int_2^4 (mg(x) - 2x)dx = 15 \; then \; m = \frac{9}{4}$
146.	If $f(a+b-x) = f(x)$, then $\int_a^b xf(x)dx = \frac{a+b}{2}\int_a^b f(x)dx$
147.	$\int_0^{2a} f(x)dx = \int_0^{a} f(x)dx + \int_0^{2a} f(2a-x)dx.$
148.	If $f(x) = \int_0^x t \sin t\, dt$, then $f'(x) = x \sin x$.
149.	$\int_{-\pi/2}^{\pi/2} (x^3 + x\cos x + tan^5 x + 1)dx = \pi$
150.	$\int_0^\pi xf(\sin x)dx = \frac{\pi}{2}\int_0^\pi f(\sin x)dx.$
151.	$\int_a^b \frac{f(x)}{f(x)+f(a+b-x)}dx = \frac{b+a}{2}.$
152.	$\int_1^4 f(x)dx = 37$, where $f(x) = \begin{cases} 4x+3, 1 \le x \le 2 \\ 3x+5, 2 \le x \le 4 \end{cases}.$
153.	$\int_0^{2\pi} \cos^{-1}(\cos x)\, dx = 4\pi^2$
154.	$\int_a^b f(x)dx = \int_a^b f(t)dt.$
155.	$\int_a^b f(x)dx = \int_b^a f(x)dx.$

ANSWERS

Q.N0	Answer	Q.N0	Answer	Q.N0	Answer
1.	FALSE	26.	TRUE	51.	FALSE
2.	TRUE	27.	FALSE	52.	FALSE
3.	FALSE	28.	TRUE	53.	FALSE
4.	FALSE	29.	TRUE	54.	TRUE
5.	TRUE	30.	TRUE	55.	FALSE
6.	FALSE	31.	TRUE	56.	TRUE
7.	TRUE	32.	TRUE	57.	TRUE
8.	TRUE	33.	FALSE	58.	FALSE
9.	TRUE	34.	TRUE	59.	TRUE
10.	FALSE	35.	FALSE	60.	TRUE
11.	TRUE	36.	TRUE	61.	FALSE
12.	TRUE	37.	FALSE	62.	FALSE
13.	FALSE	38.	FALSE	63.	TRUE
14.	FALSE	39.	TRUE	64.	FALSE
15.	TRUE	40.	FALSE	65.	TRUE
16.	FALSE	41.	FALSE	66.	TRUE
17.	TRUE	42.	TRUE	67.	FALSE
18.	TRUE	43.	FALSE	68.	FALSE
19.	TRUE	44.	FALSE	69.	TRUE
20.	TRUE	45.	FALSE	70.	True
21.	FALSE	46.	FALSE	71.	TRUE
22.	FALSE	47.	FALSE	72.	FALSE
23.	TRUE	48.	FALSE	73.	TRUE
24.	FALSE	49.	FALSE	74.	FALSE
25.	TRUE	50.	FALSE	75.	FALSE

76.	TRUE	103.	FALSE	132.	TRUE
77.	TRUE	104.	TRUE	133.	FALSE
78.	TRUE	105.	TRUE	134.	FALSE
79.	FALSE	106.	TRUE	135.	FALSE
80.	TRUE	107.	FALSE	136.	TRUE
81.	TRUE	108.	FALSE	137.	TRUE
82.	FALSE	109.	TRUE	138.	TRUE

83.	FALSE	110.	TRUE	139.	FALSE
84.	TRUE	111.	TRUE	140.	TRUE
85.	FALSE	112.	FALSE	141.	FALSE
86.	TRUE	113.	TRUE	142.	TRUE
87.	TRUE	114.	TRUE	143.	FALSE
88.	TRUE	115.	TRUE	144.	FALSE
89.	TRUE	116.	FALSE	145.	TRUE
90.	FALSE	117.	TRUE	146.	TRUE
91.	FALSE	118.	FALSE	147.	FALSE
92.	TRUE	119.	FALSE	148.	TRUE
93.	TRUE	120.	TRUE	149.	TRUE
94.	FALSE	121.	FALSE	150.	TRUE
95.	TRUE	122.	FALSE	151.	FALSE
96.	FALSE	123.	TRUE	152.	TRUE
97.	TRUE	124.	TRUE	153.	FALSE
98.	TRUE	125.	TRUE	154.	TRUE
99.	TRUE	126.	TRUE	155.	FALSE
100.	TRUE	127.	FALSE		
101.	TRUE	128.	TRUE		
102.	FALSE	129.	TRUE		

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