



<https://shikshamentor.com/applied-maths-sem-ii-diploma-msbte-k-scheme-syllabus/>
312301 – Applied Mathematics (Sem II)
As per MSBTE's K Scheme
CO / CM / IF / AI / AN / DS

Unit I		Indefinite Integration	Marks - 20	
S. N.	MSBTE Board Asked Questions	Exam Year	Marks	
1.	Evaluate: $\int x(x - 1)^2 dx$	S-18	2	
2.	Evaluate: $\int \frac{1}{x^2+4} dx$	W-18	2	
3.	Evaluate: $\int \frac{1}{\sqrt{9-4x^2}} dx$	S-22	2	
4.	Evaluate: $\int \sin^2 x dx$	S-19 S-18	2	
5.	Evaluate: $\int \cos^2 x dx$	S-19	2	
6.	Evaluate: $\int \sin^3 x dx$	W-19 S-23 W-19	2 4	
7.	Evaluate: $\int \frac{\sin x}{\cos^2 x} dx$	S-22 W-22	2	
8.	Evaluate: $\int xe^x dx$	W-18 W-19 W-18	2	
9.	Evaluate: $\int \log x dx$	W-22	2	

10.	Evaluate: $\int x \cos x \, dx$	S-19 S-18	2
11.	Evaluate: $\int \frac{1}{2x+5} \, dx$	S-18	2
12.	Evaluate: $\int \frac{1}{3x+5} \, dx$	S-19	2
13.	Evaluate: $\int \frac{1}{3x^2+4} \, dx$	W-19	2
14.	Evaluate: $\int \frac{1}{3x+7} \, dx$	S-22	2
15.	Evaluate: $\int e^{2x} \, dx$	W-22	2
16.	Evaluate: $\int \frac{dx}{9+4x^2}$	S-23	2
17.	Evaluate: $\int \frac{dx}{x(x-1)}$	W-22	2
18.	Evaluate: $\int [e^{2\log x} + e^{x\log 2}] \, dx$	S-19	2
19.	Evaluate: $e^{\int 2\log x \, dx}$	S-19	2
20.	Evaluate: $\int (x^2 - e^{3x}) \, dx$	W-22	2
21.	Evaluate: $\int \sqrt{1 + \sin 2x} \, dx$	W-19	2
22.	Evaluate: $\int \frac{1}{1+\cos 2x} \, dx$	W-19	2
23.	Evaluate: $\int \sin^2 x \cos x \, dx$	W-19	2

24.	Evaluate: $\int \frac{1}{9x^2-16} dx$	W-18	2
25.	Evaluate: $\int (e^x + x^e + e^e) dx$	S-22	2
26.	Evaluate: $\int (x^a + a^x + a^a) dx$	S-19	2
27.	Evaluate: $\int (e^x + x^a + a^x + a^a) dx$	W-19	2
28.	Evaluate: $\int \frac{1-\cos 2x}{1+\cos 2x} dx$	S-18	2
29.	Evaluate: $\int \cos^2 x dx$	S-22	2
30.	Evaluate: $\int \tan^2 x dx$	W-18	2
31.	Evaluate: $\int x^2 \log x dx$	W-18	2
32.	Evaluate: $\int \frac{(1+\sqrt{x})^2}{\sqrt{x}} dx$	W-22	2
33.	Evaluate: $\int \frac{1}{\sin^2 x \cos^2 x} dx$	S-18 W-22	2
34.	Evaluate: $\int \frac{1}{(\sin^{-1} x)^2 \sqrt{1-x^2}} dx$	S-18	4
35.	Evaluate: $\int \frac{e^{m \sin^{-1} x}}{\sqrt{1-x^2}} dx$	W-18	4
36.	Evaluate: $\int \frac{\cos(\log x)}{x} dx$	S-22	4
37.	Evaluate: $\int \frac{e^x}{(e^x-1)(e^x+1)} dx$	W-19 S-19 W-22	4

38.	Evaluate: $\int \frac{(x-1)e^x}{x^2 \cdot \sin^2\left(\frac{e^x}{x}\right)} dx$	S-23 S-19 W-18 W-19	4
39.	Evaluate: $\int \frac{1}{x+\sqrt{x}} dx$	S-19	4
40.	Evaluate: $\int \frac{e^{x(x+1)}}{\cos^2(xe^x)} dx$	S-19 W-19	4
41.	Evaluate: $\int \frac{e^{x(x+1)}}{\sin^2(xe^x)} dx$	W-22 S-19 S-22	4
42.	Evaluate: $\int \frac{(\tan^{-1}x)^3}{1+x^2} dx$	W-22	4
43.	Evaluate: $\int \frac{\sec^2 x}{3+\tan x} dx$	S-22	4
44.	Evaluate: $\int \frac{(\sin^{-1} x)^3}{\sqrt{1-x^2}} dx$	W-19	4
45.	Evaluate: $\int \cos(\log x) dx$	S-18	4
46.	Evaluate: $\int \frac{\log(\tan^x/2)}{\sin x} dx$	S-18	4
47.	Evaluate: $\int \frac{\sec x \operatorname{cosec} x}{\log(\tan x)} dx$	S-18	4
48.	Evaluate: $\int \frac{1}{x[9+(\log_e x)^2]} dx$	W-18 W-22	4
49.	Evaluate: $\int \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$	W-19 S-23 S-18	4
50.	Evaluate: $\int \frac{1-\tan x}{1+\tan x} dx$	S-22	4
5.1	Evaluate: $\int \frac{\cos\sqrt{x}}{\sqrt{x}} dx$	S-22	4

52.	Evaluate: $\int \frac{\sin\sqrt{x}}{\sqrt{x}} dx$	S-18 S-22	4
	Evaluate: $\int \frac{1}{1-\cos 2x} dx$	W-22	4
53.	Evaluate: $\int \frac{\sec^2 x}{3\tan^2 x - 2\tan x - 5} dx$	S-19	4
54.	Evaluate: $\int \frac{x}{(x^2+4)(x^2+9)} dx$	W-19	4
55.	Evaluate: $\int \frac{\sec^2 x}{(1+\tan x)(3+\tan x)} dx$	W-18 S-19	4
56.	Evaluate: $\int \frac{\sec^2 x}{(1+\tan x)(2+\tan x)} dx$	W-19 S-18 W-18	4
57.	Evaluate: $\int \frac{\sec^2 x}{(1-\tan x)(2+\tan x)} dx$	S-23	4
58.	Evaluate: $\int \frac{\sec^2 x}{(1+\tan x)(2-\tan x)} dx$	S-19	4
59.	Evaluate: $\int \frac{\log x}{x(\log x+2)(\log x+3)} dx$	S-22 S-18 W-18	4
60.	Evaluate: $\int \frac{1}{x(2-\log x)(2\log x-1)} dx$	S-18	4
61.	Evaluate: $\int \frac{\cos x}{(4+\sin x)(3+\sin x)} dx$	W-22	4
62.	Evaluate: $\int \frac{\cos \theta}{(2+\sin \theta)(3+4\sin \theta)} d\theta$	S-22	4
63.	Evaluate: $\int \frac{x}{x^2+3x-4} dx$	W-22	4
64.	Evaluate: $\int \frac{x+1}{x(x^2-4)} dx$	S-18	4

65.	Evaluate: $\int \frac{x dx}{(x+1)(x+2)}$	W-18	4
66.	Evaluate: $\int \frac{2x^2+5}{(x-1)(x+2)(x+3)} dx$	W-18 S-19 W-19	4
67.	Evaluate: $\int \frac{x^2+1}{(x+1)(x+2)(x-3)} dx$	W-18	4
68.	Evaluate: $\int \frac{dx}{x^2+3x+2}$	S-22 W-22	4
69.	Evaluate: $\int \frac{dx}{x^2+4x+5}$	W-18	2/4
70.	Evaluate: $\int \frac{1}{9x^2+6x+10} dx$	W-22	4
71.	Evaluate: $\int \frac{x+1}{x^2(x-2)} dx$	S-18	4
72.	Evaluate: $\int x \log(1+x) dx$	W-18 W-22	4
73.	Evaluate: $\int x \tan^{-1} x dx$	S-19 S-22 W-18 W-22	4
74.	Evaluate: $\int e^x \cdot \sin 4x dx$	S-22 S-19 W-22	4
75.	Evaluate: $\int e^{3x} x^2 dx$	W-19	4
76.	Evaluate: $\int \tan^{-1} x dx$	W-19 W-22 S-22	4
77.	Evaluate: $\int \frac{1}{\sqrt{13-6x-x^2}} dx$	S-23 S-22	4
78.	Evaluate: $\int \frac{1}{\sqrt{16-6x-x^2}} dx$	S-19 S-22	4

79.	Evaluate: $\int \frac{1}{\sqrt{3-x-x^2}} dx$	W-22	4
80.	Evaluate: $\int \frac{1}{\sqrt{x^2+4x+13}} dx$	W-18	4
81.	Evaluate: $\int \frac{dx}{2x^2+3x+1}$	W-19 S-18	4
82.	Evaluate: $\int \frac{dx}{3+2x-x^2}$	W-22	4
83.	Evaluate: $\int \sec^3 x dx$	W-18	4
84.	Evaluate: $\int \frac{1}{x^2+4x+9} dx$	S-18	4
85.	Evaluate: $\int \frac{1}{x^2+4x+25} dx$	W-18	4
86.	Evaluate: $\int \frac{\cos x}{1+\sin^2 x} dx$	S-18 W-22	4
87.	Evaluate: $\int x^2 \cos 2x dx$	S-19	4
88.	Evaluate: $\int x^2 \tan x dx$	W-19	4
89.	Evaluate: $\int x \operatorname{cosec}^{-1} x dx$	S-18	4
90.	Evaluate: $\int x \log x dx$	W-22	4
91.	Evaluate: $\int \frac{1}{3+2\sin x} dx$	S-22 W-22	4
92.	Evaluate: $\int \frac{1}{3-2\sin x} dx$	S-18	4

93.	Evaluate: $\int \frac{1}{2+3\cos x} dx$	W-22 S-19 W-18	4
94.	Evaluate: $\int \frac{dx}{5+4\cos x}$	S-18 S-22 S-19 W-18 W-22	4
95.	Evaluate: $\int \frac{dx}{4+5\cos x}$	S-19 W-19	4
96.	Evaluate: $\int \frac{dx}{5+3\cos 2x}$	W-19	4
97.	Evaluate: $\int \frac{1}{2\sin x+3\cos x} dx$	W-18	4
98.	Evaluate: $\int \frac{dx}{1+\sin x+\cos x}$	S-19 W-19	4
99.	Evaluate: $\int \frac{dx}{3+2\sin x+\cos x}$	W-22	4
100.	Evaluate: $\int \frac{dx}{5-4\sin x}$	S-23 W-19	4
101.	Evaluate: $\int \frac{x}{1+\cos 2x} dx$	S-18	4
102.	Evaluate: $\int \frac{dx}{4\cos^2 x+9\sin^2 x}$	S-22 W-18	4
103.	Evaluate: $\int \frac{1}{a^2\sin^2 x+b^2\cos^2 x}$	S-18	4

Thank You

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