

CHAPTER 7

INTEGRALS

SAY 2018

1. Find the following

a) $\int \frac{f(x)}{x^2+1} dx = \log|x^2+1| + C,$
 then $f(x) = \dots\dots\dots$ (1)

b) $\int xe^x dx$ (2)

2. Find $\int (4x+7)\sqrt{x^2+4x+13} dx$ (4)

3. a) If f is a function such that $f(-x) = f(x),$
 then $\int_{-a}^a f(x) dx = \dots\dots\dots$ (1)

b) Evaluate: $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x dx = \dots\dots\dots$ (2)

c) Evaluate: $\int_0^1 (x^2+1) dx$ as the limit of a sum. (3)

MARCH 2018

4. a) $\int_0^a f(a-x) dx = \dots\dots\dots$ (1)

$\left[\begin{array}{ll} \text{i) } \int_0^{2a} f(x) dx & \text{ii) } \int_{-a}^a f(x) dx \\ \text{iii) } \int_0^a f(x) dx & \text{iv) } \int_a^0 f(x) dx \end{array} \right]$

b) Find the value of $\int_0^{\frac{\pi}{2}} \frac{\sin^4 x}{\sin^4 x + \cos^4 x} dx$ (2)

c) Evaluate: $\int_0^2 (x^2+1) dx$ as the limit of a sum. (4)

5. Find the following

a) $\int \sin mx dx$ (1)

b) $\int \frac{dx}{\sqrt{x^2+2x+2}} dx$ (3)

c) $\int \frac{xdx}{(x+1)(x+2)}$ (2)

SAY 2017

6. Find the following

a) $\int \frac{4x-10}{\sqrt{(x-2)(x-3)}} dx$ (3)

b) $\int \frac{1}{(x^2+1)(x^2+4)} dx$ (3)

Evaluate $\int_0^{\pi/4} \log(1+\tan x) dx$ (4)

OR

Evaluate $\int_0^1 e^x dx$ as the limit of a sum. (4)

MARCH 2017

7. Find the following:

a) $\int \frac{1}{x(x^7+1)} dx$ (3)

b) $\int_1^4 |x-2| dx$ (3)

8. Evaluate $\int_0^{\pi/2} \log \sin x dx$ (4)

OR

Evaluate $\int_0^4 x^2 dx$ as the limit of a sum. (4)

SAY 2016

9. Find the following :

a) $\int \cot x \log \sin x dx$ (2)

b) $\int \frac{1}{x^2 + 2x + 2} dx$ (2)

c) $\int x e^{9x} dx$ (2)

10. Find $\int_0^{\pi} \frac{x}{1 + \sin x} dx$ (4)

OR

11. Find $\int_0^2 e^x dx$ as the limit of a sum. (4)

MARCH 2016

12. a) Prove that $\int \cos^2 x dx = \frac{x}{2} + \frac{\sin 2x}{4} + C$ (2)

b) Find $\int \frac{dx}{\sqrt{2x - x^2}}$ (2)

c) Find $\int x \cos x dx$ (2)

13. Evaluate $\int_0^{\pi} \log(1 + \cos x) dx$ (4)

OR

Find $\int_0^5 (x+1) dx$ as the limit of a sum. (4)

SAY 2015

14. a) $\int \frac{2x}{1+x^2} dx = \dots\dots\dots$ (1)

b) Find $\int \frac{1}{x^2 - 6x + 13} dx$ (2)

c) Find $\int x^2 e^{x^2} dx$ (2)

15. a) Evaluate: $\int_1^2 \frac{x}{(x+1)(x+2)} dx$ (2)

b) Evaluate: $\int_0^{\pi} \frac{x}{1 + \sin x} dx$ (3)

OR

Evaluate $\int_0^2 e^x dx$ as the limit of a sum. (5)

MARCH 2015

16. Integrate the following:

(a) $\frac{x-1}{x+1}$ (1)

(b) $\frac{\sin x}{\sin(x-a)}$ (2)

(c) $\frac{1}{\sqrt{3-2x-x^2}}$ (3)

17. (a) What is the value of $\int_0^1 x(1-x)^9 dx$?

i) $\frac{1}{10}$ ii) $\frac{1}{11}$

iii) $\frac{1}{90}$ iv) $\frac{1}{110}$ (1)

(b) Find $\int_0^1 (2x+3) dx$ as the limit of a sum. (3)

SAY 2014

18. a) $\int \frac{2x}{1+x^2} dx = \dots\dots\dots$ (1)

b) Find $\int \frac{1}{9x^2 + 6x + 5} dx$ (2)

c) Find $\int \frac{x}{(x-1)^2(x+2)} dx$ (2)

19. a) The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x dx = \dots\dots\dots$ (1)

b) Prove that $\int_0^{\pi} \frac{xdx}{a^2 \cos^2 x + b^2 \sin^2 x} = \frac{\pi^2}{2ab}$ (4)

MARCH 2014

20. a) $\int e^x \sec x (1 + \tan x) dx =$
 A) $e^x \cos x + C$ B) $e^x \sec x + C$
 C) $e^x \tan x + C$ D) $e^x \sin x + C$ (1)

b) Find $\int \sin 2x \cos 3x dx$ (2)

c) Find $\int \frac{dx}{(x-1)(x+2)}$ (2)

21. a) Evaluate: $\int_2^3 \frac{x}{x^2+1} dx$ (2)

b) Evaluate $\int_0^\pi \frac{x dx}{1+\sin x}$ (3)

SAY 2013

22. a) Evaluate $\int \frac{x+3}{\sqrt{5-4x-x^2}} dx$ (3)

b) Evaluate $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{x dx}{1+\sqrt{\tan x}}$ (2)

23. a) Evaluate $\int \log x dx$ (1)

b) Evaluate $\int x^2 \tan^{-1} x dx$ (3)

c) Find $\int_{-1}^2 |x^3 - x| dx$ (2)

MARCH 2013

24. a) Find $\int \cot x dx$ (1)

b) Find $\int x \log x dx$ (2)

c) $\int \frac{x-1}{(x-2)(x-3)} dx$ (2)

25. a) Choose the correct property from the

following: (1)

i) $\int_0^a f(x) dx = \int_{2a}^0 f(a-x) dx$

ii) $\int_0^a f(x) dx = \int_0^{2a} f(a-x) dx$

iii) $\int_0^a f(x) dx = \int_0^a f(a-x) dx$

iv) $\int_0^a f(x) dx = \int_a^0 f(a-x) dx$

b) Show that $\int_0^{\frac{\pi}{4}} \log(1+\tan x) dx = \frac{\pi}{8} \log 2$ (4)

SAY 2012

26. i) What is $\int \frac{1}{9+x^2} dx$? (1)

ii) Evaluate $\int \frac{1}{1+x+x^2+x^3} dx$? (4)

27. i) Evaluate $\int_0^3 f(x) dx$,
 where $f(x) = \begin{cases} x+3; 0 \leq x \leq 2 \\ 3x; 2 \leq x \leq 3 \end{cases}$ (2)

ii) Prove that
 $\int_0^1 \log\left(\frac{x}{x-1}\right) dx = \int_0^1 \log\left(\frac{x-1}{x}\right) dx$, find the
 value of $\int_0^1 \log\left(\frac{x}{x-1}\right) dx$ (3)

MARCH 2012

28. a) Evaluate $\int \sin x dx = \dots\dots\dots$ (1)

b) Evaluate $\int \sin^2(2x+3) dx$ (2)

29. a) If $f(x) = \int_0^x t \sin t \, dt$, then $f'(x) = \dots\dots\dots$

(1)

b) Evaluate $\int_0^\pi \frac{x \sin x}{1 + \cos^2 x} dx$

(4)

SAY 2011

30. a) $\int e^x dx = \dots\dots\dots$

(1)

b) Evaluate $\int x^2 e^{2x} dx$

(2)

c) Evaluate $\int \sin 2x e^{\cos^2 x} dx$

(3)

31. a) Evaluate $\int_1^2 \frac{1}{x(1 + \log x)^2} dx$

(2)

b) Evaluate $\int_0^3 (2x^2 + 3) dx$ as a limit of a sum.

(3)

MARCH 2011

32. a) Fill in the blanks. $\int \cot x \, dx = \dots\dots\dots$

(1)

b) i) Evaluate $\int \sin 2x \cos 4x \, dx$

(2)

ii) $\int \frac{x}{(x+1)(x+2)} dx$

(2)

33. a) Evaluate $\int_0^1 x \, dx$ as the limit of a sum.

(2)

b) Evaluate $\int_0^1 x(1-x)^n \, dx$

(3)

SAY 2010

34. a) Using the result

$$\int \frac{dx}{\sqrt{x^2 + a^2}} = \log \left| x + \sqrt{x^2 + a^2} \right| + C,$$

Evaluate $\int -\frac{\operatorname{cosec}^2 x}{\sqrt{\cot^2 x + 9}} dx$

(2)

b) Evaluate $\int (\cos^{-1} x)^2 \, dx$

(3)

35. a) Evaluate $\int_0^\pi \frac{x \sin x}{1 + \cos^2 x} dx$

(3)

b) Evaluate $\int_0^1 e^x \, dx$ as the limit of a sum.

(2)

MARCH 2010

36. a) $\int \frac{1 - \tan^2 x}{1 + \tan^2 x} dx = \dots\dots\dots$

(1)

b) Choose the correct answer from the bracket

$$\int e^x (1 + \tan x + \tan^2 x) dx = \dots\dots\dots$$

$$\left(\begin{array}{ll} e^x \tan x + C; & e^x (1 + \tan x) + C; \\ e^x \tan^2 x + C; & e^x \sec^2 x + C \end{array} \right)$$

(1)

c) Using proper substitution, evaluate

$$\int \frac{1}{x + x(\log x)^2} dx$$

(2)

37. a) Find $\int (\log x)^2 \, dx$

(2)

b) Find $\int \frac{1}{\sqrt{x(1-2x)}} dx$

(3)

OR

a) Find $\int \frac{x}{(x+1)(x-2)} dx$

(2)

b) Using the substitution $t = \tan\left(\frac{x}{2}\right)$, evaluate

$$\text{the integral } \int \frac{1}{1 + \sin x + \cos x} dx$$

(3)

c) Evaluate $\int_0^2 (x^2 - 1) dx$ as the limit of a sum.

(4)

OR

d) Using the property

$$\int_0^a f(x) dx = \int_0^a f(a-x) dx,$$

prove that $\int_0^{\frac{\pi}{2}} \sin 2x \log \tan x \, dx = 0$ (4)

SAY 2009

38. Fill in the blanks:

a) $\int \frac{1}{\sqrt{1-x^2}} dx = \dots\dots\dots$ (1)

b) $\int \sec x \, dx = \dots\dots\dots$ (1)

c) $\int \log x \, dx = \dots\dots\dots$ (1)

39. Evaluate the following integrals:

a) $\int \frac{2x-1}{(x-1)(x+2)^2} dx$ (3)

b) $\int \frac{\cot(\log x)}{x} dx$ (2)

c) $\int \frac{1}{x^2+4x+10} dx$ (2)

OR

40. Evaluate the following integrals:

a) $\int e^x \sin x \, dx$ (2)

b) $\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx$ (2)

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

41. Fill in the blanks

a) Consider $I = \int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$

i) Show that $I = \int_0^{\frac{\pi}{2}} \frac{\sqrt{\cos x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$ (2)

ii) Using (i), find the value of I (2)

MARCH 2009

42. $\int_0^{\frac{\pi}{2}} \sqrt{1-\cos 2x} \, dx = \dots\dots\dots$ (2)

43. Evaluate the following integrals:

a) $\int \frac{1}{1+e^x} dx$ (2)

b) $\int x^2 \cos x \, dx$ (2)

MARCH 2008

44. Evaluate:

a) $\int \frac{dx}{(e^x + e^{-x})^2}$ (2)

b) $\int \frac{x-1}{(x-2)(x-3)} dx$ (2)

c) $\int x^2 e^x dx$ (2)

45. a) Evaluate:

i) $\int \frac{\sin(2+3\log x)}{x} dx$ (2)

ii) $\int \frac{1}{(x-1)\sqrt{x+2}} dx$ (3)

(b) Evaluate $\int_a^b x^3 dx$ as the limit of a sum. (3)

OR

(a) Evaluate $\int_a^b \sin x \, dx$ as the limit of a sum. (3)

(b) Evaluate $\int_0^{\frac{\pi}{2}} \frac{x \sin x}{1+\cos^2 x} dx$ (4)

MARCH 2007

(1)

46. Evaluate the following.

$$a) \int \frac{\sec^2 x}{\sqrt{\tan^2 x + 4}} dx \quad (2)$$

$$b) \int \frac{\sin x}{\sin(x+a)} dx \quad (3)$$

$$c) \int_{-5}^5 |x+2| dx \quad (3)$$

$$47. \text{ Evaluate } \int_0^{\pi/4} \log(1 + \tan x) dx \quad (4)$$

MARCH 2006

$$48. \int \frac{\cos 2x}{\cos x + \sin x} dx \text{ is} \quad (1)$$

- a) $\log(\cos x + \sin x) + C$
 b) $\sin 2x + C$ c) $\cos x + \sin x + C$
 d) $\cos x - \sin x + C$

$$49. \int_0^2 |1-x| dx \text{ is equal to}$$

- a) 0 b) 1
 c) 2 d) 4

$$50. \text{ Evaluate } \int_0^1 x e^{x^2} dx \quad (2)$$

$$51. \text{ Find } \int x \log x dx \quad (2)$$

$$52. \text{ Find } \int \frac{\sqrt{\tan x}}{\sin x \cos x} dx \quad (2)$$

$$53. \text{ Evaluate } \int_0^{\pi/2} \sin^2(x/2) dx \quad (2)$$

$$54. \text{ Find } \int e^x \sec x (1 + \tan x) dx \quad (3)$$

$$55. \text{ Evaluate } \int_0^{\pi/2} \frac{dx}{5 + \cos x} \quad (5)$$

56. Which of the following statements is incorrect?

$$a) \int_0^a f(x) dx = \int_0^a f(a-x) dx$$

$$b) \int_{-a}^a f(x) dx = 2 \int_0^a f(x) dx, \text{ if } f(x) \text{ is even}$$

$$c) \int_0^{2a} f(x) dx = 2 \int_0^a f(x) dx, \text{ if } f(2a-x) = f(x)$$

$$d) \int_0^{2a} f(x) dx = 2 \int_0^a f(x) dx, \text{ if } f(a-x) = f(x)$$

$$57. \text{ Evaluate } \int \sin^2(3x) dx \quad (2)$$

$$58. \text{ Evaluate } \int \frac{x}{(x-1)(x-2)} dx \quad (2)$$

$$59. \text{ Evaluate } \int \frac{1}{3\cos x + 4\sin x} dx \quad (3)$$

$$60. \text{ Evaluate } \int_0^{\pi/2} \cos^2 x dx \quad (3)$$

$$61. \text{ Prove that } \int_0^{\pi} x \cos^2 x dx = \frac{\pi^2}{8} \quad (5)$$

OR

$$\text{Evaluate } \int_1^2 x^2 dx \text{ as the limit of a sum.} \quad (5)$$

MARCH 2005

$$62. \int \frac{dx}{e^x + e^{-x}} \text{ is } \dots\dots\dots (1)$$

$$63. \log(e^x + e^{-x}) + C \quad (1)$$

$$a) \log(e^x + e^{-x}) + C \quad b) e^{-x} + e^x + C$$

$$c) \tan^{-1}(e^x) + C \quad d) e^x - e^{-x} + C$$

$$64. \int_{-\pi}^{\pi} \sin^3 x dx \quad (1)$$

- a) 1 b) 2
 c) 0 d) -2

65. Find $\int \frac{dx}{\sqrt{2-4x+x^2}}$ (2)

66. Evaluate $\int_0^{\pi/2} \sqrt{\sin x} \cos x dx$ (2)

67. Integrate $x^2 \log x$ (3)

68. Find $\int \log(1+x^2) dx$ (3)

69. Evaluate $\int_0^{\pi/4} \log(1+\tan x) dx$ (5)

70. $\int_0^{\pi/2} \frac{\sin^n \theta}{\sin^n \theta + \cos^n \theta} d\theta = \dots\dots\dots$ (1)

71. $\int \frac{e^{\sqrt{x}} \cos(e^{\sqrt{x}})}{2\sqrt{x}} dx$ is $\dots\dots\dots$ (1)

78. Evaluate $\int_0^{\pi} \frac{dx}{5+3\cos x}$ (5)

OR

79. Evaluate $\int_0^{\pi} (2x+3) dx$ as the limit of a sum. (5)

80. $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$ is equal to (1)

- a) $\cos \sqrt{x} + C$ b) $\frac{\cos \sqrt{x}}{\sqrt{x}} + C$
 c) $-2 \cos \sqrt{x} + C$ d) $\frac{-2 \cos \sqrt{x}}{\sqrt{x}} + C$

81. The value of $\int_0^{\pi/2} \sin^2 x dx$ is $\dots\dots\dots$ (1)

- a) π b) $\frac{\pi}{2}$
 c) $\frac{\pi}{4}$ d) 0

JUNE 2004 [For Regular and Improvement]

72. $\int e^x (\sec x + \sec x \tan x) dx = \dots\dots\dots$ (1)

- a) $e^x \tan x$ b) $e^x \sec x \tan x$
 c) $e^x \sec x$ d) $e^x \cos x \sin x$

73. $\int_0^1 \frac{\tan^{-1} x}{1+x^2} dx =$ (1)

- a) $\frac{\pi^2}{32}$ b) $\frac{\pi}{4}$
 c) $\frac{\pi}{2}$ d) $\frac{\pi}{3}$

74. Evaluate $\int e^{\cos^2 x} \sin 2x dx$ (2)

75. Integrate $x^3 \log x$ wrt x (2)

76. Evaluate $\int \frac{e^x (1+\sin x)}{(1+\cos x)} dx$ (3)

77. Evaluate $\int_0^{\pi/2} \frac{\cos x}{\sin x + \cos x} dx$ (3)

82. The value $\int_0^{\infty} \frac{dx}{1+x^2}$ is (1)

- a) $\frac{\pi}{2}$ b) ∞
 c) 1 d) 0.

83. The value of $\int \log x dx$ is (1)

- a) $x \log x - x + C$ b) $x \log x + x + C$
 c) $\frac{1}{x}$ d) $-x \log x - x + C$

84. Evaluate $\int \frac{dx}{1-9x^2}$ (2)

85. Evaluate $\int_0^{\pi/2} \frac{\sin x dx}{1+\cos^2 x}$ (3)

86. Evaluate $\int \frac{(\cos^{-1} x)^2}{\sqrt{1-x^2}} dx$ (3)

87. Integrate $\sin^2 x \cos 5x$ wrt x (3)

88. Evaluate $\int \frac{dx}{\sqrt{2-4x+x^2}}$ (5)

89. Evaluate $\int \frac{dx}{4+5\sin x}$ (5)

90. Integrate $e^{2x} \sin 3x$ w.r.t. x (5)

91. Evaluate $\int \frac{dx}{x^3+1}$ (5)

92. Evaluate $\int_0^{\frac{\pi}{2}} x^3 \sin 3x dx$ (5)

MARCH 2004

93. The value of $\int_0^{\pi/2} \cos^2 x dx$ (1)

- a) 1 b) 0
c) $\frac{\pi}{4}$ d) π

94. Evaluate $\int \sin x \sin(\cos x) dx$ (1)

95. Evaluate $\int \frac{1}{\sqrt{4x^2+4x+5}} dx$ (3)

96. Evaluate $\int \frac{e^x(1+x)dx}{\cos^2(xe^x)}$ (3)

97. Evaluate $\int_0^{\pi} \frac{dx}{1+\sin x}$ (5)

98. Evaluate $\int_0^{\pi/4} \log(1+\tan x) dx$ (5)

OR

99. Evaluate $\int_0^5 (x+1) dx$ as the limit of a sum. (5)

SAY 2003

100. $\int_0^{\pi/2} \cos^2 \theta d\theta$ is (1)

a) $\frac{\pi}{3}$ b) π

c) $\frac{\pi}{2}$ d) $\frac{\pi}{4}$

101. $\int_0^1 \frac{dx}{1+x^2} =$ (1)

a) $\frac{\pi}{4}$ b) $\frac{\pi}{2}$

c) π d) 0

102. $\int_0^{\frac{\pi}{2}} \frac{\sin x}{1+\cos^2 x} dx =$ (1)

a) π b) $\frac{\pi}{4}$

c) $\frac{\pi}{2}$ d) 0

103. $\int_0^{\infty} \frac{x}{1+x^2} dx =$ (1)

a) 0 b) 1

c) ∞ d) $\log 2$

104. If $\int_0^a 3x^2 dx = 27$, find a . (2)

105. Integrate $\frac{\sin \sqrt{x}}{\sqrt{x}}$ wrt x (2)

106. Evaluate $\int_0^a \frac{dx}{(a^2+x^2)^{3/2}}$ (2)

107. Integrate $\frac{1}{1+x-x^2}$ w.r.t. x (3)

108. Evaluate $\int \frac{dx}{4+5\sin x}$ (5)

109. Integrate $\frac{3x+4}{x^2-5x+6}$ wrt x (5)

110. Evaluate $\int_0^{\pi/2} \log \tan x dx$ (5)

MARCH 2003

111. $\int \frac{e^x(1+x)}{\cos^2(xe^x)} dx$ is (1)

- a) $2 \log \cos(xe^x) + C$ b) $\sec(xe^x) + C$
 c) $\tan(xe^x) + C$ d) $e^x \tan(xe^x) + C$

112. $\int_0^{\frac{\pi}{2}} \log \tan x \, dx = \dots\dots$ (1)

- a) 1 (b) 0
 (c) -1 (d) $\frac{\pi}{4}$

113. Evaluate $\int x^2 \sin(x^3) \, dx$ (2)

114. Evaluate $\int \frac{x}{(x-1)(x-2)} \, dx$ (3)

115. Evaluate $\int \frac{(\tan^{-1} x)^2}{1+x^2} \, dx$ (3)

116. Show that $\int_0^{\frac{\pi}{2}} \cos^2 x \, dx = \int_0^{\frac{\pi}{2}} \sin^2 x \, dx$ and the value of each integral is $\frac{\pi}{4}$. (3)

117. Evaluate $\int_0^{\pi} x \cos^2 x \, dx$ (5)

OR

Evaluate $\int_0^2 e^x \, dx$ as the limit of a sum. (5)

MARCH 2002

118. $\int (e^{a \log x} + e^{x \log a}) \, dx$ is (1)

- a) $ax + a^x + C$ b) $a^x \log x + \log C$
 c) $\frac{x^{a+1}}{a+1} + \frac{a^x}{\log a} + C$ d) $\frac{x^a}{a} + \frac{a^x}{x} + C$

119. $\int \frac{dx}{(1+x^2) \tan^{-1} x}$ is (1)

- a) $\log(1+x^2)$
 b) $\log|\tan^{-1} x| + C$
 c) $\log|(1+x^2) \tan^{-1} x| + C$
 d) $\frac{\log(1+x^2)}{\tan^{-1} x} + C$

120. $\int_0^{\frac{\pi}{4}} \tan x \, dx + C$ (1)

- a) $\log 2$ b) $\log \sqrt{2}$
 c) $\log \frac{\pi}{4}$ d) $\log \frac{\pi}{8}$

121. $\int_0^{\frac{\pi}{2}} \sin^2 x \, dx$ (1)

- a) $\log 2$ b) $\log \sqrt{2}$
 c) $\log \frac{\pi}{4}$ d) $\log \frac{\pi}{8}$

122. Integrate $e^x \cos 2x$ w.r.t x (2)

123. Evaluate $\int \frac{4x}{x^2 - 3x + 2} \, dx$ (2)

124. Evaluate $\int_0^{\frac{\pi}{2}} \frac{\cos x}{1 + \sin^2 x} \, dx$ (3)

125. Integrate $\int \frac{\cos^{-1} x}{\sqrt{1-x^2}} \, dx$ (2)

126. Integrate $\frac{1}{5x^2 - 2x + 7}$ w.r.t x (3)

127. Integrate $\frac{1}{3 + 5 \cos x}$ w.r.t x (3)

128. Integrate $x^2 (\log x)^2$ w.r.t x (5)

129. Evaluate $\int_0^{\frac{\pi}{2}} \log(\tan x) dx$ (5)

MARCH 2001

130. The value of $\int \frac{x}{1-x^4} dx$ is: (1)

a) $\frac{1}{4} \log \left| \frac{1+x^2}{1-x^2} \right| + C$

b) $\frac{1}{4} \log \left| \frac{1-x^2}{1+x^2} \right| + C$

c) $-\frac{1}{4} \log \left| \frac{1-x^2}{1+x^2} \right| + C$

d) $-\frac{1}{4} \log \left| \frac{1+x^2}{1-x^2} \right| + C$

131. $\int_0^{\pi/2} \frac{\cos x}{\sin x + \cos x} dx =$ (1)

a) $\frac{\pi}{2}$

(b) $\frac{\pi}{4}$

(c) $\frac{\pi}{6}$

(d) $\frac{\pi}{8}$

132. $\int_0^4 \sqrt{3x+4} dx =$ (1)

a) $\frac{59}{6}$

(b) $\frac{56}{9}$

(c) $\frac{28}{9}$

(d) $\frac{112}{9}$

133. $\int_{-\infty}^0 e^{2x} dx =$ (1)

a) 0

(b) $\frac{1}{2}$

(c) $-\frac{1}{2}$

(d) 1

134. Integrate $x \log 2x$ w. r. to x . (2)

135. Evaluate $\int_0^{\pi/2} \frac{dx}{1+\tan^3 x}$ (3)

136. Integrate $\frac{\log x}{x^2}$ w. r. to x . (3)

137. Evaluate $\int_1^{e^2} \frac{dx}{x(1+\log x)^2}$ (3)

138. Integrate $\frac{x^2+1}{x^2-5x+6}$ w. r. to x . (5)

139. Evaluate $\int \frac{dx}{41+9\cos x}$. (5)

140. Integrate $\frac{1}{9x^2+12x+13}$ w. r. to x . (5)

141. Evaluate $\int_0^{\pi/4} \log(1+\tan x) dx$ (5)

