EXERCISE – I SINGLE CORRECT (OBJECTIVE QUESTIONS)

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

(A) cosec α ℓn $\left|\frac{\sin x}{\sin(x+\alpha)}\right|+C$

(B) cosec α ℓn $\left|\frac{\sin(x+\alpha)}{\sin x}\right|+C$

(C) cosec α ℓn $\left|\frac{\sec(x+\alpha)}{\sec x}\right|+C$

(D) cosec α ℓn $\left|\frac{\sec x}{\sec(x+\alpha)}\right|+C$

2. $\int \frac{a^{\sqrt{x}}}{\sqrt{x}}$ dx is equal to

(A) $\frac{a^{\sqrt{x}}}{\sqrt{x}}$ + c (B) $\frac{2a^{\sqrt{x}}}{\log a}$ + c

(C) $2a^{\sqrt{x}}.\ell$n a + c (D) None of these

3. $\int 5^{5^{5^x}}.5^{5^x}.5^x$ dx is equal to

(A) $\frac{5^{5^x}}{(\log 5)^3}$ + c (B) $5^{5^{5^x}}$ $(\ell n\ 5)^3$ + c

(C) $\frac{5^{5^{5^x}}}{(\log 5)^3}$ + c (D) None of these

4. $\int \frac{\sqrt{\tan x}}{\sin x\cos x}$ dx is equal to

(A) $2\sqrt{\tan x}+c$ (B) $2\sqrt{\cot x}+c$

(C) $\frac{\sqrt{\tan x}}{2}+c$ (D) None of these

5. If $\int \frac{2^x}{\sqrt{1-4^x}}$ dx = K $\sin^{-1}(2^x)$ + C, then K is equal to

(A) ℓn 2 (B) $\frac{1}{2}$ ℓn 2 (C) $\frac{1}{2}$ (D) $\frac{1}{\ell n 2}$

6. If y = $\int \frac{dx}{(1+x^2)^{3/2}}$ and y = 0 when x = 0, then value of y when x = 1 is

(A) $\sqrt{\frac{2}{3}}$ (B) $\sqrt{2}$ (C) $3\sqrt{2}$ (D) $\frac{1}{\sqrt{2}}$

7. $\int \frac{dx}{x^2+x+1}$ is equal to

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

(C) $\frac{1}{\sqrt{3}}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)+c$ (D) None of these

8. $\int (x-1)e^{-x}$ dx is equal to

(A) $-xe^x+C$ (B) xe^x+C
(C) $-xe^{-x}+C$ (D) $xe^{-x}+C$

9. $\int \tan^3 2x \sec 2x\, dx$ is equal to

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

(B) $-\frac{1}{6}\sec^3 2x - \frac{1}{2}\sec 2x + c$

(C) $\frac{1}{6}\sec^3 2x - \frac{1}{2}\sec 2x + c$

(D) $\frac{1}{3}\sec^3 2x + \frac{1}{2}\sec 2x + c$

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

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

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

11. $\int \frac{1}{x^2(x^4+1)^{3/4}}\,dx$ is equal to

(A) $\left(1+\frac{1}{x^4}\right)^{1/4} + c$ (B) $(x^4+1)^{1/4} + c$

(C) $\left(1-\frac{1}{x^4}\right)^{1/4} + c$ (D) $-\left(1+\frac{1}{x^4}\right)^{1/4} + c$

12. If $\int \frac{1}{1+\sin x}\,dx = \tan\left(\frac{x}{2}+a\right) + b$, then

(A) $a = -\frac{\pi}{4}, b \in R$ (B) $a = \frac{\pi}{4}, b \in R$

(C) $a = \frac{5\pi}{4}, b \in R$ (D) None of these

13. $\int [f(x)g''(x) - f''(x)g(x)]\,dx$ is equal to

(A) $\frac{f(x)}{g'(x)}$ (B) $f'(x)\,g(x) - f(x)\,g'(x)$

(C) $f(x)\,g'(x) - f'(x)\,g(x)$ (D) $f(x)\,g'(x) + f'(x)\,g'(x)$

14. $\int (\sin 2x - \cos 2x)\,dx = \frac{1}{\sqrt{2}} \sin(2x - a) + b$, then

(A) $a = \frac{5\pi}{4}, b \in R$ (B) $a = -\frac{5\pi}{4}, b \in R$

(C) $a = \frac{\pi}{4}, b \in R$ (D) None of these

15. $\int \frac{\cos 2x}{(\sin x + \cos x)^2}\,dx$ is equal to

(A) $\frac{-1}{\sin x + \cos x} + c$ (B) $\ell n(\sin x + \cos x) + c$

(C) $\ell n(\sin x - \cos x) + c$ (D) $\ell n(\sin x + \cos x)^2 + c$

16. $\int \frac{1}{x(x^n+1)}\,dx$ is equal to

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

(C) $\ell n\left(\frac{x^n}{x^n+1}\right) + c$ (D) None of these

17. $\int [1+\tan x.\tan(x+\alpha)]\,dx$ is equal to

(A) $\cos\alpha\,.\,\ell n\left|\frac{\sin x}{\sin(x+\alpha)}\right| + C$

(B) $\tan\alpha\,.\,\ell n\left|\frac{\sin x}{\sin(x+\alpha)}\right| + C$

(C) $\cot\alpha\,.\,\ell n\left|\frac{\sec(x+\alpha)}{\sec x}\right| + C$

(D) $\cot\alpha\,.\,\ell n\left|\frac{\cos(x+\alpha)}{\cos x}\right| + C$

18. $\int \sqrt{\frac{e^x-1}{e^x+1}}\,dx$ is equal to

(A) $\ell n\,(e^x + \sqrt{e^{2x}-1}) - \sec^{-1}(e^x) + C$

(B) $\ell n\,(e^x + \sqrt{e^{2x}-1}) + \sec^{-1}(e^x) + C$

(C) $\ell n\,(e^x - \sqrt{e^{2x}-1}) - \sec^{-1}(e^x) + C$

(D) None of these

19. If $\int \frac{dx}{x^4+x^3} = \frac{A}{x^2} + \frac{B}{x} + \ell n\left|\frac{x}{x+1}\right| + C$, then

(A) $A = \frac{1}{2}, B = 1$ (B) $A = 1, B = -\frac{1}{2}$

(C) $A = -\frac{1}{2}, B = 1$ (D) None of these

20. $\int \sqrt{\sec x - 1}\,dx$ is equal to

(A) $2\,\ell n\left(\cos\frac{x}{2} + \sqrt{\cos^2\frac{x}{2} - \frac{1}{2}}\right) + C$

(B) $2\,\ell n\left(\cos\frac{x}{2} + \sqrt{\cos^2\frac{x}{2} - \frac{1}{2}}\right) + C$

(C) $-2\,\ell n\left(\cos\frac{x}{2} + \sqrt{\cos^2\frac{x}{2} - \frac{1}{2}}\right) + C$

(D) None of these

21. $\int \frac{dx}{\cos^3 x\sqrt{\sin 2x}}$ is equal to

(A) $\sqrt{2}\left(\sqrt{\cos x}+\frac{1}{5}\tan^{5/2} x\right)+C$

(B) $\sqrt{2}\left(\sqrt{\tan x}+\frac{1}{5}\tan^{5/2} x\right)+C$

(C) $\sqrt{2}\left(\sqrt{\tan x}-\frac{1}{5}\tan^{5/2} x\right)+C$ (D) None of these

22. If $\int \frac{4e^x+6e^{-x}}{9e^x-4e^{-x}}dx = Ax + B\,\ell n\,(9e^{2x}-4) + C$, then

(A) $A = -\frac{3}{2}$, $B = \frac{35}{36}$, $c = 0$

(B) $A = \frac{35}{36}$, $B = -\frac{3}{2}$, $c \in R$

(C) $A = -\frac{3}{2}$, $B = \frac{35}{36}$, $c \in R$ (D) None of these

23. If $f(x) = \int \frac{2\sin x-\sin 2x}{x^3}dx$ where $x \neq 0$ then $\underset{x\to 0}{\text{Limit}}$ f '(x) has the value

(A) 0 (B) 1 (C) 2 (D) Not defined

24. If $\int \frac{\cos 4x+1}{\cot x-\tan x}dx = A\cos 4x + B$ where A & B are constants, then

(A) $A = -1/4$ & B may have any value

(B) $A = -1/8$ & B may have any value

(C) $A = -1/2$ & $B = -1/4$ (D) None of these

25. $\int \frac{e^{\sqrt{x}}}{\sqrt{x}}(x+\sqrt{x})\,dx$ is equal to

(A) $2e^{\sqrt{x}}[\sqrt{x}-x+1]+c$ (B) $2e^{\sqrt{x}}[x-2\sqrt{x}+1]+c$

(C) $2e^{\sqrt{x}}[x-\sqrt{x}+1]+c$ (D) $2e^{\sqrt{x}}[x+\sqrt{x}+1]+c$

26. $\int e^{\tan\theta}(\sec\theta-\sin\theta)\,d\theta$ is equal to

(A) $-e^{\tan\theta}\sin\theta + c$ (B) $e^{\tan\theta}\sin\theta + c$

(C) $e^{\tan\theta}\sec\theta + c$ (D) $e^{\tan\theta}\cos\theta + c$

27. $\int \frac{1-x^7}{x(1+x^7)}$ dx is equal to

(A) $\ell n\,x + \frac{2}{7}\ell n\,(1+x^7) + c$

(B) $\ell n\,x - \frac{2}{7}\ell n\,(1-x^7) + c$

(C) $\ell n\,x - \frac{2}{7}\ell n\,(1+x^7) + c$

(D) $\ell n\,x + \frac{2}{7}\ell n\,(1-x^7) + c$

28. $\int \sqrt{\frac{1-\cos x}{\cos\alpha-\cos x}}$ dx where $0 < \alpha < x < \pi$, is equal to

(A) $2\,\ell n\left(\cos\frac{\alpha}{2}-\cos\frac{x}{2}\right)+c$ (B) $\sqrt{2}\,\ell n\left(\cos\frac{\alpha}{2}-\cos\frac{x}{2}\right)+c$

(C) $2\sqrt{2}\,\ell n\left(\cos\frac{\alpha}{2}-\cos\frac{x}{2}\right)+c$

(D) $-2\sin^{-1}\left(\frac{\cos\frac{x}{2}}{\cos\frac{\alpha}{2}}\right)+c$

29. $\int \frac{1}{[(x-1)^3(x+2)^5]^{1/4}}$ dx is equal to

(A) $\frac{4}{3}\left(\frac{x-1}{x+2}\right)^{1/4}+C$ (B) $\frac{4}{3}\left(\frac{x+1}{x-2}\right)^{1/4}+C$

(C) $\frac{1}{3}\left(\frac{x-1}{x+2}\right)^{1/4}+C$ (D) $\frac{1}{3}\left(\frac{x+1}{x-2}\right)^{1/4}+C$

30. $\int (x\,e^{\ell n\sin x}-\cos x)\,dx$ is equal to :

(A) $x\cos x + c$ (B) $\sin x - x\cos x + c$

(C) $-e^{\ell n\,x}\cos x + c$ (D) $\sin x + x\cos x + c$

31. Antiderivative of $\frac{\sin^2 x}{1+\sin^2 x}$ w.r.t. x is :

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

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

(C) $x - \sqrt{2}\arctan(\sqrt{2}\tan x) + c$

(D) $x - \sqrt{2}\arctan\left(\frac{\tan x}{\sqrt{2}}\right) + c$

32. $\int 4\sin x\cos\frac{x}{2}\cos\frac{3x}{2}\,dx$ is equal to

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

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

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

(D) $\cos x + \frac{1}{2}\cos 2x - \frac{1}{3}\cos 3x + c$

33. $\int\sqrt{\frac{1-\sqrt{x}}{1+\sqrt{x}}}\,dx$ is equal to

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

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

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

(D) $\sqrt{x}\sqrt{1-x} + 2\sqrt{1-x} - \cos^{-1}(\sqrt{x}) + c$

34. $\int \sin x\,.\cos x\,.\cos 2x\,.\cos 4x\,.\cos 8x\,.\cos 16x\,dx$ is equal to

(A) $\frac{\sin 16x}{1024} + c$ (B) $-\frac{\cos 32x}{1024} + c$

(C) $\frac{\cos 32x}{1096} + c$ (D) $-\frac{\cos 32x}{1096} + c$

35. $\int\frac{1}{\cos^6 + \sin^6 x}\,dx$ is equal to

(A) $\tan^{-1}(\tan x + \cot x) + c$
(B) $-\tan^{-1}(\tan x + \cot x) + c$
(C) $\tan^{-1}(\tan x - \cot x) + c$
(D) $-\tan^{-1}(\tan x - \cot x) + c$

36. $\int\left\{\ell n(1+\sin x) + x\tan\left(\frac{\pi}{4} - \frac{x}{2}\right)\right\}dx$ is equal to

(A) $x\,\ell n\,(1 + \sin x) + c$ (B) $\ell n\,(1 + \sin x) + c$
(C) $-x\,\ell n\,(1 + \sin x) + c$ (D) $\ell n\,(1 - \sin x) + c$

37. $\int\sqrt{\frac{x-1}{x+1}}\,.\,\frac{1}{x^2}\,dx$ is equal to

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

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

38. $\int\frac{dx}{\cos^3 x.\sqrt{\sin 2x}}$ is equal to

(A) $\frac{\sqrt{2}}{5}(\tan x)^{5/2} + 2\sqrt{\tan x} + c$

(B) $\frac{\sqrt{2}}{5}(\tan^2 x + 5)\sqrt{\tan x} + c$

(C) $\frac{\sqrt{2}}{5}(\tan^2 x + 5)\sqrt{2\tan x} + c$ (D) None of these

39. If $\int\frac{dx}{\sqrt{\sin^3 x\cos^5 x}} = a\sqrt{\cot x} + b\sqrt{\tan^3 x} + c$ where c is an arbitrary constant of integration then the values of 'a' and 'b' are respectively :

(A) -2 & $\frac{2}{3}$ (B) 2& $-\frac{2}{3}$

(C) 2 & $\frac{2}{3}$ (D) None of these

40. $\int\left\{\frac{(\log x - 1)}{1 + (\log x)^2}\right\}^2 dx$ is equal to

(A) $\frac{x}{(\log x)^2 + 1} + c$ (B) $\frac{xe^x}{1 + x^2} + c$

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

41. If $\int\frac{\sin x}{\sin(x-a)}\,dx = Ax + B\log\sin(x - a) + c$, then value of (A, B) is

(A) $(\sin\alpha, \cos\alpha)$ (B) $(\cos\alpha, \sin\alpha)$
(C) $(-\sin\alpha, \cos\alpha)$ (D) $(-\cos\alpha, \sin\alpha)$

42. $\int\frac{dx}{\cos x - \sin x}$ is equal to

(A) $\frac{1}{\sqrt{2}}\log\left|\tan\left(\frac{x}{2} - \frac{3\pi}{8}\right)\right| + c$ (B) $\frac{1}{\sqrt{2}}\log\left|\cot\left(\frac{x}{2}\right)\right| + c$

(C) $\frac{1}{\sqrt{2}}\log\left|\cot\left(\frac{x}{2} - \frac{3\pi}{8}\right)\right| + c$ (D) $\frac{1}{\sqrt{2}}\log\left|\tan\left(\frac{x}{2} + \frac{3\pi}{8}\right)\right| + c$

43. If $\int \frac{1}{x+x^5}\,dx = f(x)+C$, then the value of $\int \frac{x^4}{x+x^5}\,dx$ is equal to

(A) $\log x - f(x) + C$ (B) $f(x) + \log x + C$

(C) $f(x) - \log x + C$ (D) None of these

44. Primitive of $\frac{3x^4-1}{(x^4+x+1)^2}$ w.r.t. x is

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

(C) $\frac{x+1}{x^4+x+1} + c$ (D) $-\frac{x+1}{x^4+x+1} + c$

45. If $\int \frac{x^4+1}{x(x^2+1)^2}\,dx = A\,\ell n\,|x| + \frac{B}{1+x^2} + c$,

where c is the constant of integration then

(A) A = 1; B = −1 (B) A = −1; B = 1

(C) A = 1; B = 1 (D) A = −1; B = −1

46. $\int x.\frac{\ell n(x+\sqrt{1+x^2})}{\sqrt{1+x^2}}\,dx$ is equal to

(A) $\sqrt{1+x^2}\,.\ell n\,(x+\sqrt{1+x^2}) - x + c$

(B) $\frac{x}{2}.\ell n^2\,(x+\sqrt{1+x^2}) - \frac{x}{\sqrt{1+x^2}} + c$

(C) $\frac{x}{2}.\ell n^2\,(x+\sqrt{1+x^2}) + \frac{x}{\sqrt{1+x^2}} + c$

(D) $\sqrt{1+x^2}\,\ell n\,(x+\sqrt{1+x^2}) + x + c$

47. If $\int \frac{1}{x\sqrt{1-x^3}}\,dx = a\,\ell n\left|\frac{\sqrt{1-x^3}-1}{\sqrt{1-x^3}+1}\right| + b$, then a is equal to

(A) 1/3 (B) 2/3 (C) −1/3 (D) −2/3

48. $\int \frac{\cos^3 x}{\sin^2 x+\sin x}\,dx$ is equal to

(A) $\ell n\,|\sin x| + \sin x + c$ (B) $\ell n\,|\sin x| - \sin x + c$

(C) $-\ell n\,|\sin x| - \sin x + c$ (D) $-\ell n\,|\sin x| + \sin x + c$

49. $\int \frac{1}{\sqrt{\sin^3 x\cos x}}\,dx$ is equal to

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

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

50. $\int \frac{x^3-1}{x^3+x}\,dx$ is equal to

(A) $x - \ell n\,x + \ell n\,(x^2+1) - \tan^{-1} x + c$

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

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

(D) None of these

51. $\int \frac{\ell n|x|}{x\sqrt{1+\ell n|x|}}\,dx$ is equal to

(A) $\frac{2}{3}\sqrt{1+\ell n|x|}\,(\ell n\,|x| - 2) + c$

(B) $\frac{2}{3}\sqrt{1+\ell n|x|}\,(\ell n\,|x| + 2) + c$

(C) $\frac{1}{3}\sqrt{1+\ell n|x|}\,(\ell n\,|x| - 2) + c$

(D) $\frac{1}{3}\sqrt{1+\ell n|x|}\,(3\ell n\,|x| + 2) + c$

52. If $\int \frac{x\tan^{-1}x}{\sqrt{1+x^2}}\,dx = \sqrt{1+x^2}\ f(x) + A\,\ell n\,(x+\sqrt{x^2+1}) + C$, then

(A) $f(x) = \tan^{-1} x$, A = −1 (B) $f(x) = \tan^{-1} x$, A = 1

(C) $f(x) = 2\tan^{-1} x$, A = −1 (D) $f(x) = 2\tan^{-1} x$, A = 1

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

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

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

54. $\int \{1+2\tan x(\tan x+\sec x)\}^{1/2}\,dx$ is equal to

(A) $\ell n\,\sec x\,(\sec x - \tan x) + c$

(B) $\ell n\,\text{cosec}\,x\,(\sec x + \tan x) + c$

(C) $\ell n\,\sec x\,(\sec x + \tan x) + c$

(D) $\ell n\,(\sec x + \tan x) + c$

55. $\int \frac{x\,dx}{\sqrt{1+x^2+\sqrt{(1+x^2)^3}}}$ dx is equal to

(A) $\frac{1}{2}\,\ell n(1+\sqrt{1+x^2})+c$ (B) $2\sqrt{1+\sqrt{1+x^2}}+c$

(C) $2(1+\sqrt{1+x^2})+c$ (D) None of these

56. $\int \frac{1+x^4}{(1-x^4)^{3/2}}$ dx is equal to

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

(C) $\frac{1}{\sqrt{\frac{1}{x^2}+x^2}}+c$ (D) None of these

57. $\int\left(\sqrt{\frac{a+x}{a-x}}-\sqrt{\frac{a-x}{a+x}}\right)$ dx is equal to

(A) $-2\sqrt{a^2-x^2}+C$ (B) $\sqrt{a^2-x^2}+C$

(C) $-\sqrt{x^2-a^2}+C$ (D) None of these

58. $\int \tan(x-\alpha)\tan(x+\alpha)$ tan 2x dx is equal to

(A) $\ell n\left|\frac{\sqrt{\sec 2x}.\sec(x+\alpha)}{\sec(x-\alpha)}\right|+C$

(B) $\ell n\left|\frac{\sqrt{\sec 2x}}{\sec(x-\alpha)\sec(x+\alpha)}\right|+C$

(C) $\ell n\left|\frac{\sqrt{\sec 2x}.\sec(x+\alpha)}{\sec(x+\alpha)}\right|+C$ (D) None of these

59. If $\int x^{13/2}.(1+x^{5/2})^{1/2}dx = A(1+x^{5/2})^{7/2}+B(1+x^{5/2})^{5/2}$ $+ C(1+x^{5/2})^{3/2}$, then

(A) $A=-\frac{4}{35}$, $B=-\frac{8}{25}$, $C=\frac{4}{15}$

(B) $A=\frac{4}{35}$, $B=-\frac{8}{25}$, $C=-\frac{4}{15}$

(C) $A=\frac{4}{35}$, $B=-\frac{8}{25}$, $C=\frac{4}{15}$ (D) None of these

60. $2\int \sin x.\operatorname{cosec} 4x\,dx$ is equal to

(A) $\frac{1}{2\sqrt{2}}\,\ell n\,\frac{1+\sqrt{2}\sin x}{1-\sqrt{2}\sin x}-\frac{1}{4}\,\ell n\,\frac{1+\sin x}{1-\sin x}+C$

(B) $\frac{1}{2\sqrt{2}}\,\ell n\,\frac{1+\sqrt{2}\sin x}{1-\sqrt{2}\sin x}+\frac{1}{4}\,\ell n\,\frac{1+\sin x}{1-\sin x}+C$

(C) $\frac{1}{2\sqrt{2}}\,\ell n\,\frac{1-\sqrt{2}\sin x}{1+\sqrt{2}\sin x}-\frac{1}{4}\,\ell n\,\frac{1+\sin x}{1-\sin x}+C$

(D) None of these

61. $\int \frac{\tan^{-1}x-\cot^{-1}x}{\tan^{-1}x+\cot^{-1}x}$ dx is equal to

(A) $\frac{4}{\pi}x\tan^{-1}x+\frac{2}{\pi}\,\ell n\,(1+x^2)-x+c$

(B) $\frac{4}{\pi}x\tan^{-1}x-\frac{2}{\pi}\,\ell n\,(1+x^2)+x+c$

(C) $\frac{4}{\pi}x\tan^{-1}x+\frac{2}{\pi}\,\ell n\,(1+x^2)+x+c$

(D) $\frac{4}{\pi}x\tan^{-1}x-\frac{2}{\pi}\,\ell n\,(1+x^2)-x+c$