ABHYAS 03(INTEGRATION)
Class 12 - Mathematics

1. $\int \frac{1}{5+4\sin x} dx = A\tan^{-1}\left(B\tan \frac{x}{2} + \frac{4}{3}\right) + C$, then   **[1]**

    a) $A = -\frac{2}{3}, B = \frac{5}{3}$ b) $A = \frac{1}{3}, B = \frac{2}{3}$

    c) $A = \frac{1}{3}, B = -\frac{5}{3}$ d) $A = \frac{2}{3}, B = \frac{5}{3}$

2. $\int_{-2}^{1} \frac{|x|}{x} dx = ?$ **[1]**

    a) None of these   b) 3

    c) 2.5   d) 1.5

3. $\int_{-\pi}^{\pi} \left(\sin^{61} x + x^{123}\right) dx = ?$ **[1]**

    a) 125π b) 2π

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

4. $\int (x2^x)\, dx = ?$ **[1]**

    a) $\frac{2^x}{(\log 2)^2}$ (x log 2 - 1) + C   b) None of these

    c) $\frac{x \cdot 2^x}{(\log 2)} + \frac{2^x}{(\log 2)^2}$ + C   d) $\frac{2^x}{(\log 2)}$ (x + log 2) + C

5. The value of the integral $\int_{-2}^{2} |1 - x^2|\, dx$ is   **[1]**

    a) 4   b) 0

    c) 2   d) -2

6. Evaluate: $\int \sin^3 x\, dx$ **[1]**

7. Evaluate the integral: $\int \frac{x^2+1}{x^4+7x^2+1} dx$ **[1]**

8. Evaluate: $\int \sin(e^x) d(e^x)$ **[1]**

9. Evaluate: $\int \frac{1+\cos 4x}{\cot x - \tan x} dx$ **[1]**

10. Evaluate $\int \frac{10x^9 + 10^x \cdot log_e 10}{x^{10} + 10^x} dx$ **[1]**

11. Evaluate: $\int \frac{dx}{\sin x \cos^2 x}$.   **[1]**

12. Evaluate $\int_{-1}^{1} \log\left(\frac{2-x}{2+x}\right) dx$ **[1]**

13. Evaluate: $\int \frac{dx}{\sqrt{7-6x-x^2}}$ **[1]**

14. Evaluate: $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{(1-3\cos x)}{\sin^2 x} dx$ **[1]**

15. Evaluate : $\int x^9 dx$.   **[1]**

16. Integrate the function $\frac{x^2}{1-x^6}$.   **[1]**

17. Evaluate : $\int x^{-7} dx$.   **[1]**

18. Find $\int x^2 \tan^{-1} x\, dx$. [2]

19. Evaluate: $\int e^x (\tan x + \log \sec x)\, dx$ [2]

20. Evaluate: $\int \sin^{-1}(3x - 4x^3)\, dx$ [2]

21. Evaluate: $\int \frac{\sin 2x}{\sin 5x \sin 3x}\, dx$ [2]

22. Evaluate the integral: $\int \frac{x+2}{(x+1)^3}\, dx$ [2]

23. Evaluate: $\int \sin^4 x \cos^3 x\, dx$ [2]

24. Integrate the function $\sqrt{x^2 + 3x}$ [2]

25. Evaluate: $\int \frac{1}{2 - 3\cos 2x}\, dx$ [2]

26. Evaluate: $\int_1^2 \frac{dx}{\sqrt{x^2 + 4x + 3}}$ [2]

27. Evaluate $\int_0^2 \left(x^2 + 2x + 1\right) dx$ [2]

28. Evaluate: $\int_{-\pi/4}^{\pi/4} \frac{x^{11} - 3x^9 + 5x^7 - x^5 + 1}{\cos^2 x}\, dx$ [2]

29. Evaluate: $\int \frac{1 - \cos x}{\cos x (1 + \cos x)}\, dx$ [2]

30. Evaluate: $\frac{x^2}{(9 + 4x^2)}\, dx$ [2]

31. Evaluate: $\int_0^{3/2} |x \sin \pi x|\, dx$ [2]

32. Evaluate $\int \frac{3x + 5}{\sqrt{7x + 9}}\, dx$ [3]

33. Evaluate: $\int \sin^5 x\, dx$ [3]

34. Evaluate the integral: $\int (x + 2)\sqrt{x^2 + x + 1}\, dx$ [3]

35. Evaluate $\int \frac{x^{\frac{1}{2}}}{1 + x^{\frac{3}{4}}}\, dx$ [3]

(Hint : Put x = z^4)

36. Evaluate $\int_1^4 \left(3x^2 + 2x\right) dx$ [3]

37. Evaluate the integral: $\int_0^{\pi/2} |\sin x - \cos x|\, dx$ [3]

38. $\int_0^\pi \frac{x \sin x}{1 + \cos^2 x}$ [3]

39. Evaluate: $\int_0^2 \left(x^2 - x\right) dx$ [3]

40. Integrate the function $\frac{2x}{x^2 + 3x + 2}$ [5]

41. Evaluate: $\int \frac{x}{\sqrt{8 + x - x^2}}\, dx$ [5]

42. Evaluate $\int \frac{2x - 1}{(x-1)(x+2)(x-3)}\, dx$ [5]

43. Evaluate $\int_0^{\frac{1}{2}} \frac{dx}{(1 + x^2)\sqrt{1 - x^2}}$ (Hint: let x = sin θ) [5]

44. Evaluate: $\int_1^3 \left(3x^2 + 2x + 1\right) dx$ [5]

45. Evaluate: $\int \frac{(5x + 8)}{x^2 (3x + 8)}\, dx$. [5]

46. Evaluate the integral as limit of sum: $\int_1^3 e^{-x}\, dx$. [5]

47. Evaluate $\int_1^3 \left(2x^2 + 5x\right) dx$ as a limit of a sum. [5]

48. Prove that $\int_0^{\pi/4} (\sqrt{\tan x} + \sqrt{\cot x})\, dx = \sqrt{2} \cdot \frac{\pi}{2}$ [5]

49. Evaluate: $\int_0^2 |x^2 + 2x - 3|\, dx$. [2]

50. By using the properties of definite integrals, evaluate the integral $\int_0^4 |x - 1|\, dx$. [2]