DPP – 05

Do Yourself (Questions From NCERT)

Q. Integrate following functions

1. $\frac{2x}{1+x^2}$

2. $\frac{(\log x)^2}{x}$

3. $\frac{1}{x+x\log x}$

4. $\sin x \sin(\cos x)$

5. $\sin(ax+b)\cos(ax+b)$

6. $\sqrt{ax+b}$

7. $x\sqrt{x+2}$

8. $x\sqrt{1+2x^2}$

9. $(4x+2)\sqrt{x^2+x+1}$

10. $\frac{1}{x-\sqrt{x}}$

11. $\frac{x}{\sqrt{x+4}}, x>0$

12. $(x^3-1)^{\frac{1}{3}}x^5$

13. $\frac{x^2}{(2+3x^3)^3}$

14. $\frac{1}{x(\log x)^m}, x>0, m\neq 1$

15. $\frac{x}{9-4x^2}$

16. e^{2x+3}

17. $\frac{x}{e^{x^2}}$

18. $\frac{e^{\tan^{-1}x}}{1+x^2}$

19. $\frac{e^{2x}-1}{e^{2x}+1}$

20. $\frac{e^{2x}-e^{-2x}}{e^{2x}+e^{-2x}}$

21. $\tan^2(2x-3)$

22. $\sec^2(7-4x)$

23. $\frac{\sin^{-1}x}{\sqrt{1-x^2}}$

24. $\frac{2\cos x-3\sin x}{6\cos x+4\sin x}$

25. $\frac{1}{\cos^2 x(1-\tan x)^2}$

26. $\frac{\cos\sqrt{x}}{\sqrt{x}}$

27. $\sqrt{\sin 2x}\cos 2x$

28. $\frac{\cos x}{\sqrt{1+\sin x}}$

29. $\cot x \log \sin x$

30. $\frac{\sin x}{1+\cos x}$

31. $\frac{\sin x}{(1+\cos x)^2}$

32. $\frac{1}{1+\cot x}$

33. $\frac{1}{1-\tan x}$

34. $\frac{\sqrt{\tan x}}{\sin x \cos x}$

35. $\frac{(1+\log x)^2}{x}$

36. $\frac{(x+1)(x+\log x)^2}{x}$

37. $\frac{x^3\sin(\tan^{-1}x^4)}{1+x^8}$

38. $\int \frac{10x^9+10^x\log_e 10 dx}{x^{10}+10^x}$ equals

(A) $10^x - x^{10} + C$

(B) $10^x + x^{10} + C$

(C) $(10^x - x^{10})^{-1} + C$

(D) $\log(10^x + x^{10}) + C$

39. $\int \frac{dx}{\sin^2 x \cos^2 x}$ equals

(A) $\tan x + \cot x + C$

(B) $\tan x - \cot x + C$

(C) $\tan x \cot x + C$

(D) $\tan x - \cot 2x + C$

Answer Key

1. $\log(1+x^2)+C$

2. $\frac{1}{3}(\log|x|)^3+C$

3. $\log|1+\log x|+C$

4. $\cos(\cos x)+C$

5. $-\frac{1}{4a}\cos 2(ax+b)+C$

6. $\frac{2}{3a}(ax+b)^{\frac{3}{2}}+C$

7. $\frac{2}{5}(x+2)^{\frac{5}{2}}-\frac{4}{3}(x+2)^{\frac{3}{2}}+C$

8. $\frac{1}{6}(1+2x^2)^{\frac{3}{2}}+C$

9. $\frac{4}{3}(x^2+x+1)^{\frac{3}{2}}+C$

10. $2\log|\sqrt{x}-1|+C$

11. $\frac{2}{3}\sqrt{x+4}(x-8)+C$

12. $\frac{1}{7}(x^3-1)^{\frac{7}{3}}+\frac{1}{4}(x^3-1)^{\frac{4}{3}}+C$

13. $-\frac{1}{18(2+3x^3)^2}+C$

14. $\frac{(\log x)^{1-m}}{1-m}+C$

15. $-\frac{1}{8}\log|9-4x^2|+C$

16. $\frac{1}{2}e^{2x+3}+C$

17. $-\frac{1}{2e^{x^2}}+C$

18. $e^{\tan^{-1}x}+C$

19. $\log(e^x+e^{-x})+C$

20. $\frac{1}{2}\log(e^{2x}+e^{-2x})+C$

21. $\frac{1}{2}\tan(2x-3)-x+C$

22. $-\frac{1}{4}\tan(7-4x)+C$

23. $\frac{1}{2}(\sin^{-1}x)^2+C$

24. $\frac{1}{2}\log|2\sin x+3\cos x|+C$

25. $\frac{1}{(1-\tan x)}+C$

26. $2\sin\sqrt{x}+C$

27. $\frac{1}{3}(\sin 2x)^{\frac{3}{2}}+C$

28. $2\sqrt{1+\sin x}+C$

29. $\frac{1}{2}(\log\sin x)^2+C$

30. $-\log|1+\cos x|+C$

31. $\frac{1}{1+\cos x}+C$

32. $\frac{x}{2}-\frac{1}{2}\log|\cos x+\sin x|+C$

33. $\frac{x}{2}-\frac{1}{2}\log|\cos x-\sin x|+C$

34. $2\sqrt{\tan x}+C$

35. $\frac{1}{3}(1+\log x)^3+C$

36. $\frac{1}{3}(x+\log x)^3+C$

37. $-\frac{1}{4}\cos(\tan^{-1}\chi^4)+C$

38. D

39. B