MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 65

Total Marks : 34

Max. Time : 39 min.

Topic : Indefinite Integration

Type of Questions		M.M., Min.
Single choice Objective (no negative marking) Q.1, 2	(3 marks, 3 min.)	[6, 6]
Subjective Questions (no negative marking) Q.3,4,5,6,7	(4 marks, 5 min.)	[20, 25]
Match the Following (no negative marking) Q.8	(8 marks, 8 min.)	[8, 8]

1. $\int \frac{dx}{(x^2+4x+5)^2}$ is equal to

(A) $\frac{1}{2}\left[\tan^{-1}(x+1)+\frac{x+2}{x^2+4x+5}\right]+c$

(B) $\frac{1}{2}\left[\tan^{-1}(x+2)-\frac{x+2}{x^2+4x+5}\right]+c$

(C) $\frac{1}{2}\left[\tan^{-1}(x+1)-\frac{x+2}{x^2+4x+5}\right]+c$

(D) $\frac{1}{2}\left[\tan^{-1}(x+2)+\frac{x+2}{x^2+4x+5}\right]+c$

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

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

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

(C) $2\left(1+\sqrt{1+x^2}\right)+c$

(D) $4\sqrt{1+\sqrt{1+x^2}}+c$

3. Integrate : $\int \frac{(x+\sqrt{1+x^2})^{2009}}{\sqrt{1+x^2}}\,dx$

4. Integrate : $x^{13/2}\,.\,(1+x^{5/2})^{1/2}$ w. r. t. x

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

6. Evaluate : $\int \frac{(\sin^{3/2}\theta+\cos^{3/2}\theta)\,d\theta}{\sqrt{\sin^3\theta\ \cos^3\theta\sin(\theta+\alpha)}}$

7. Evaluate : $\int \frac{(x^2-4)}{(x^2+1)(x^2+2)(x^2+3)}\,dx.$

8.

Column - I	Column - II
(A) $\int\sqrt{1+\sec x}\,dx$ is equal to	(p) $\tan^{-1}(\tan^2 x)+c$
(B) $\int \frac{dx}{(\sin x-2\cos x)(2\sin x+\cos x)}$ is equal to	(q) $\tan^{-1}\left(\sqrt{\cos x+\sec x+1}\right)+c$
(C) $\int \frac{\sin 2x}{\sin^4 x+\cos^4 x}\,dx$ is equal to	(r) $\frac{1}{5}\log_e\left\lvert\frac{\tan x-2}{2\tan x+1}\right\rvert+c$
(D) $\int \frac{\sin^3(x/2)}{\cos(x/2).\sqrt{\cos^3 x+\cos^2 x+\cos x}}\,dx$ is equal to	(s) $2\tan^{-1}\sqrt{\frac{1-\cos x}{\cos x}}+c$

Answers Key

1. (D) **2.** (B) **3.** $\frac{(x+\sqrt{1+x^2})^{2009}}{2009} + c$

4. [$\frac{4}{5}\left[\frac{t^7}{7} - \frac{2t^5}{5} + \frac{t^3}{3}\right] + c$ where $t^2 = 1 + x^{5/2}$]s

5. $\frac{2}{\sqrt{3}} \tan^{-1}\left\{\frac{x}{\sqrt{3(x+1)}}\right\} + C$

6. $\frac{2}{\cos\alpha}\sqrt{(\cos\alpha\tan\theta + \sin\alpha)}$

$-\frac{2}{\sin\alpha}\sqrt{(\cos\alpha + \cot\theta\sin\alpha)} + c$

7. $-\frac{5}{2}\tan^{-1}x + \frac{6}{\sqrt{2}}\tan^{-1}\left(\frac{x}{\sqrt{2}}\right) - \frac{7}{2\sqrt{3}}\tan^{-1}\left(\frac{x}{\sqrt{3}}\right) + c$

8. (A) $\rightarrow$ s ; (B) $\rightarrow$ r ; (C) $\rightarrow$ p ; (D) $\rightarrow$ q