MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 67

Total Marks : 30

Max. Time : 30 min.

Topics : Permutation & Combination, Indefinite Integration, Definite 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 to Q.8	**(4 marks, 5 min.)**	**[24, 24]**

1. How many maximum points of intersection can we get by arranging 8 straight lines and 4 circles in a plane ?

(A) 100 (B) 104 (C) 64 (D) 92

2. $\int \frac{x^2+2}{x^4+4}\,dx$ is equal to

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

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

3. 20 points lie on a circle. Find the number of triangle that can be formed such that no two vertices are consecutive.

4. Evaluate :

(i) $\int_0^2 |x^2+2x-3|\,dx$ (ii) $\int_0^4 \{x\}\,dx$, where {.} denotes fractional part function

5. (i) $\int_1^4 \{x\}^{[x]}\,dx$ is equal to (where [.] and {.} represent greatest integer function and fractional part function respectively).

(ii) The value of $\int_0^2 [x+[x+[x]]]\,dx$ is (where [.] represent greatest integer function).

6. Evaluate :

(i) $\int_{-1}^3 (|x|+|x-1|)dx$ (ii) $\int_0^{\pi} |\cos x|\,dx$

7. Evaluate :

(i) $\int_{-1}^1 e^{|x|}\,dx$ (ii) $\int_0^1 |\sin 2\pi x|\,dx$ (iii) $\int_{-1}^1 \frac{x\,dx}{\sqrt{5-4x}}$

8. Integrate :

(i) $\int \frac{x^4+1}{x(x^2+1)^2}\,dx$ (ii) $\int \frac{(3x^2-1)\cot^{-1}x}{2x\sqrt{x}}\,dx$

Answers Key

1. B **2.** B **3.** 800 **4.** (i) 4 (ii) 2

5. (i) $\frac{13}{12}$ (ii) 3 **6.** (i) 9 (ii) 2

7. (i) $2e - 2$ (ii) $\frac{1}{6}$ (iii) $\frac{2}{\pi}$

8. (i) $\ln x + \frac{1}{1+x^2} + c$

(ii) $\frac{(x^2+1)\cot^{-1}x}{\sqrt{x}} + 2\sqrt{x} + c$