**Roll No. .....** **Total Pages : 4**

# 2203/M

**K-33/2051**

**APPLIED MATHEMATICS-II**

Paper–DBAS-105

Semester–II

Time allowed : 3 Hours] [Maximum Marks : 50

**Note :** The candidates are required to attempt three questions each from section A and section B carrying 5 marks each and the entire section C consisting of 10 questions carrying 2 marks each.

## SECTION-A

1. Test the following system of equations for consistency :

$2x - y + 3z = 4, x + y - 3z = -1$ and $5x - y + 3z = 7$.



2. Evaluate $\lim_{x \to 0} (\sec x - \tan x)$.

3. Differentiate $\cot^{-1} \sqrt{\frac{1 + \cos 2x}{1 - \cos 2x}}$ w.r.t. $x$.

4. If $x = a(\ + \sin\ ) : y = a(1 + \cos\ )$ Find $\frac{dy}{dx}$ .

## SECTION-B

5. Integrate $\cos^3 x\, dx$.

6. Integrate $\sin^5 x \cos^7 x\, dx$.

7. Calculate the median from the following data :

| Class | 0-7 | 7-14 | 14-21 | 21-28 | 28-35 | 35-42 |
|---|---|---|---|---|---|---|
| Frequencies | 8 | 7 | 14 | 16 | 9 | 6 |

8. Find the S.D. for the following data :

| Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
|---|---|---|---|---|---|---|---|---|
| No. of students | 5 | 10 | 20 | 40 | 30 | 20 | 10 | 4 |

## SECTION-C

9. (i) Find the co-factor of second column of :

$$\begin{bmatrix} 2 & 4 & 9 \\ 3 & 8 & 1 \\ 1 & 5 & 6 \end{bmatrix}$$

(ii) Evaluate $\lim_{x \to 5} \frac{\bar{x} - \bar{5}}{x - 5}$.

(iii) Differentiate *Log* [log sin $x$] w.r.t $x$.

(iv) Evaluate $e^{3 \log x} dx$.

(v) Find the integral of $\tan^2 x \, dx$.

(vi) Calculate the value of mode from the following data.

| Marks | 16 | 18 | 22 | 16 | 15 | 16 | 22 | 16 | 14 | 10 | 11 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

(vii) Calculate S.D., If co-efficient of variance is 10 and $\bar{x} = 25$.

(viii) Evaluate $\sin^9 x \, dx$.



(ix) Solve the differential equation :

$y \, dx - x \, dy = xy dx$.

(x) If A is a non-singular matrix then find $A^{-1}$.