

**M. SC. (MATHEMATICS WITH
APPLICATIONS IN COMPUTER
SCIENCE) [M. SC. (MACS)]**

Term-End Practical Examination

June, 2025

MMT–008(P)(Set-I) : PROBABILITY AND STATISTICS (PRACTICAL)

Time : 1 $\frac{1}{2}$ Hours Maximum Marks : 40

Note : (i) There are **two** questions in this paper, totaling 30 marks. Answer both of them.

(ii) Remaining 10 marks are for viva-
voce.

1. Let $X \sim N_4(\bar{\mu}, \Sigma)$, where

$$\mu = \begin{bmatrix} 2 \\ 4 \\ 1 \\ -3 \end{bmatrix}, \Sigma = \begin{bmatrix} 8 & 0 & 1 & 0 \\ 0 & 3 & 0 & 0 \\ 1 & 0 & 5 & 0 \\ 0 & 0 & 0 & 8 \end{bmatrix}$$

[2]

Write a program in 'C' language to find :

(i) Marginal distribution of $\begin{bmatrix} x_1 \\ x_3 \end{bmatrix}$.

(ii) Conditional distribution of $\begin{bmatrix} x_2 \\ x_4 \end{bmatrix}$ given $\begin{bmatrix} x_1 \\ x_3 \end{bmatrix} = \begin{bmatrix} 1 \\ -4 \end{bmatrix}$.

(iii) Correlation coefficient between x_2 and x_4 . 15

2. Write a 'C' program to fit a model $y = b_0 + b_1 x_1 + b_2 x_2$ for $n \leq 20$ observations.

Extend your program for the data : 15

y_n	x_{1n}	x_{2n}
1	1	0
2	0	2
3	-1	-1
4	-4	-2
5	-6	5
6	-5	6
7	-3	3
8	2	-2
9	10	-4
10	5	5

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