

**M.Sc. (MATHEMATICS WITH APPLICATIONS IN COMPUTER SCIENCE)
M.Sc. (MACS)**

00378

Term-End Practical Examination

June, 2017

MMT-008(P) : PROBABILITY AND STATISTICS

Time : 1 $\frac{1}{2}$ Hours

Maximum Marks : 40

- Note : (i) There are two questions in this paper worth 30 marks. Both the questions are compulsory.*
- (ii) Remaining 10 marks are for viva-voce.*
- (iii) All the symbols used have their usual meaning.*

1. Consider $N_4(\mu, \Sigma)$, where

$$\mu = \begin{bmatrix} 1 \\ 2 \\ -1 \\ -2 \end{bmatrix} \quad \text{and} \quad \Sigma = \begin{bmatrix} 7 & 0 & 1 & 0 \\ 0 & 2 & 0 & 1 \\ 1 & 0 & 3 & 0 \\ 0 & 1 & 0 & 9 \end{bmatrix}$$

Write a program in 'C' language to obtain the conditional distribution of $\begin{bmatrix} y_1 \\ y_2 \end{bmatrix}$

given $\begin{bmatrix} y_3 \\ y_4 \end{bmatrix} = \begin{bmatrix} 1.2 \\ -2.6 \end{bmatrix}$.

15

2. Write a program in 'C' language that checks whether a quadratic form in three variables is positive definite or not. It should do the following : 15
- (a) Read the coefficients of the quadratic form.
- (b) Print the matrix corresponding to the quadratic form.
- (c) Check whether the quadratic form is positive definite or not and print the result.