M. Sc. (Mathematics with Applications in Computer Science) M. Sc. (MACS)

Term-End Examination

December, 2018

PROBABILITY AND STATISTICS

Time : 1½ Hours

Maximum Marks : 40

Note :   (i)   There are *two* questions in this paper worth 30 marks. Both questions are compulsory.

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

(iii)   All the symbols used have their usual meaning.

1. Write a program in 'C' language that checks whether a Var-Cov matrix is positive definite or not.   10

2. Consider $\underset{\sim}{Y} \sim N_3(\underset{\sim}{\mu}, \underset{\sim}{\Sigma})$, where :

$$\underset{\sim}{\mu} = \begin{bmatrix} 3 \\ 4 \\ -5 \end{bmatrix} \text{ and } \underset{\sim}{\Sigma} = \begin{bmatrix} 2 & -2 & -1 \\ -2 & 5 & -1 \\ -1 & -1 & 2 \end{bmatrix}$$

Write a program in 'C' language to find the distribution of $\underset{\sim}{C}\,\underset{\sim}{Y}$, where $\underset{\sim}{C}$ is any matrix of order 2 × 3. Test your program for :   20

$$\underset{\sim}{C} = \begin{bmatrix} 1 & 2 & 1 \\ 1 & 1 & 1 \end{bmatrix}$$