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MMT-008(P)

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

M.Sc. (MACS)

Term-End Practical Examination

June, 2015

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 the viva-voce.

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

1. Write a program in 'C' language to fit the model $y_i = b_0 + b_1 x_{1i} + b_2 x_{2i}$, $1 \le i \le n$. You may assume that $n \le 20$. Use the program to fit a linear model for the data given below : *15*

y	12	22	30	38	40	25	15	10
x_1	5	9	20	17	5	5	3	8
x_2	7	6	6	5	5	2	2	1

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

$$\mu = \begin{bmatrix} 2 \\ 4 \\ 1 \\ -3 \end{bmatrix} \text{ and } \Sigma = \begin{bmatrix} 9 & 0 & 2 & 0 \\ 0 & 4 & 0 & 1 \\ 2 & 0 & 6 & 0 \\ 0 & 1 & 0 & 9 \end{bmatrix}.$$

Write a program in 'C' language to obtain the conditional distribution of $\begin{bmatrix} y_1 \\ y_2 \end{bmatrix}$ given $\begin{bmatrix} y_3 \\ y_4 \end{bmatrix} = \begin{bmatrix} 1{\cdot}2 \\ -2{\cdot}6 \end{bmatrix}$. *15*