

M.Sc. (MATHEMATICS WITH APPLICATIONS IN COMPUTER SCIENCE)**M.Sc. (MACS)****Term-End Practical Examination**

00311

June, 2014

MMT-008 (P) : PROBABILITY AND STATISTICSTime : $1\frac{1}{2}$ hours

Maximum Marks : 40

Note : There are *two* questions in this paper, totalling 30 marks. Remaining 10 marks are for the viva-voce.

1. Let $y \sim N_3(\mu, \Sigma)$. Write a program in 'C' language to find the distribution of z , which is given as $z = a_1y_1 + a_2y_2 + a_3y_3$. Also, test your program to find the

distribution of $z = 4y_1 - 6y_2 + y_3$ for given $\mu = \begin{bmatrix} 2 \\ -1 \\ 3 \end{bmatrix}$ and $\Sigma = \begin{bmatrix} 4 & 1 & 0 \\ 1 & 2 & 1 \\ 0 & 1 & 3 \end{bmatrix}$. 15

2. Let the joint probability mass function of x and y be

$$p(x = i, y = j) = \frac{{}^2C_i {}^4C_j {}^6C_{3-i-j}}{{}^{12}C_3}, \quad 0 \leq i+j \leq 3, \quad i = 0, 1, 2, \quad j = 0, 1, 2, 3.$$

Write a program in 'C' language to find the marginal distribution of x and y . 15