

**M.Sc. (MATHEMATICS WITH  
APPLICATIONS IN COMPUTER SCIENCE)****M.Sc. (MACS)  
Term-End Practical Examination****December, 2013****MMT-008 (P) : PROBABILITY AND  
STATISTICS PRACTICAL***Time : 1½ hours**Maximum Marks : 40*

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

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1. Write a program in 'C' language to compute the Hotelling's  $T^2$ , for any  $n \leq 20$ . Extend the programme to compute Hotelling's  $T^2$  for the given Data : 20

$H_0 : \mu' = [7, 11]$  and the data matrix

$$X = \begin{bmatrix} 2 & 12 \\ 8 & 9 \\ 6 & 9 \\ 8 & 10 \end{bmatrix}$$

2. Let  $Y \sim N_p(\mu, \Sigma)$

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Write a C program to find the mean of the normal variable  $Z = AY$ . When

$$A = \begin{bmatrix} a_1 & \dots & a_p \\ b_1 & \dots & b_p \end{bmatrix}$$

Use the program to find the mean of  $Z$  when

$$A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & 2 \end{bmatrix} \text{ and } \mu = \begin{bmatrix} 2 \\ -1 \\ 3 \end{bmatrix}$$

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