2025/SEM/EVEN/08/25/STS–401/091

PG (CBCS) Even Semester Examination, May 2025

STATISTICS

4th Semester

Course No. : STSCC - 401

(Multivariate Analysis)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

(Answer five questions taking one from each unit)

Unit - I

1. (a) What is multivariate analysis? Explain some areas of application of multivariate analysis. 2+5=7

   (b) Deduce the probability density function of a multivariate normal distribution. 7

2. (a) Explain at least two methods of representing multivariate data graphically. 7

   (b) Deduce the characteristic function of a multivariate normal distribution. 7

(Turn Over)

Unit - II

3. (a) Starting from the binomial distribution deduce the pmf of a trinomial distribution. 7

   (b) Deduce the variance-covariance matrix of the multinomial distribution. 7

4. (a) Define Wishart distribution. Deduce the characteristic function of the Wishart distribution. 2+5=7

   (b) Explain the effect of linear transformation in case of Wishart distribution. 7

Unit - III

5. (a) State and deduce the two sample problem of testing of hypothesis that can be deduced from the Hotelling's T^2. 7

   (b) Prove that the Hotelling's T^2 is invariant under non-singular linear transformation. 7

6. Deduce the distribution of Hotelling's T^2 14

Unit - IV

7. (a) What is cannonical correlation? Deduce the first set of homogenious equations of the cannonical variates. 2+5=7

   (b) Explain the basic factor model of factor analysis. 7

8. Explain and deduce relevant expression for the Fisher's discriminating function. 14

Unit - V

9. Explain the process for comparing several multivariate population mean vectors and variance-covariance matrices. 14

10. Explain the multivariate General Linear model with necessary deductions. 14

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