13/10/25

TM2535048

Reg. No :.....

Name :.....

MASTER'S DEGREE (C.S.S) EXAMINATION, OCTOBER 2025

2024 ADMISSIONS REGULAR

SEMESTER III - CORE COURSE

ST3C13TM - Multivariate Analysis

Time : 3 Hours

Maximum Weight : 30

Part A

I. Answer any Eight questions. Each question carries 1 weight (8x1=8)

1. Write down any four uses of T square statistic.
2. Define Hoteling's T square statistic.
3. Define profile analysis.
4. Define Coincident profile.
5. Define Principal component.
6. Define discriminant analysis.
7. What is Bayes Procedure.
8. What do you mean by problem of classification?
9. Brief about Pillai's trace
10. What are the different distant measures?

Part B

II. Answer any Six questions. Each question carries 2 weight (6x2=12)

11. Explain Fisher - Behrens problem using Hoteling's T square statistic.
12. Explain the use of Hoteling's T^2 for finding critical region for $H: \mu^{(1)} = \mu^{(2)}$.
13. Write a short note on estimation of canonical correlation and canonical variables.
14. Show that the generalized variance of the vector of principal components is the generalized variance of the original vector and the sum of the variance of the pricipal components is equal to the sum of the variance of the original vector.
15. What are the hierarchical clustering methods. Explain the use of single, complete and average methods for clustering objects.
16. Explain non-hierarchical clustering methods.
17. Define Rahu's statistics and Pillai's trace criterion.
18. Explain two way MANOVA in detail.

Part C

III. Answer any Two questions. Each question carries 5 weight (2x5=10)

19. Show that Hoteling's T square is invariant under nonsingular linear transformations.
    Show that Mahalanobis D square statistic is invariant under nonsingular linear transformations
20. Describe the concept of factor analysis and explain the procedure to extract orthogonal factors.
21. Describe clearly Fishers method of discrimination between two groups on the basis of multiple observations. Extend the above for several groups, indicating the assumptions made, if any
22. Derive the test , for testing equality of covariance matrices of several multivariate normal populations.