TM243389F

Reg. No :.....

Name :.....

MASTER'S DEGREE (C.S.S) EXAMINATION, NOVEMBER 2024

2023 ADMISSIONS REGULAR

SEMESTER III - CORE COURSE Applied Statistics and Data Analytics

ST3C13TM - Multivariate Analysis

Time : 3 Hours **Maximum Weight : 30**

Part A

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

1. Define Mahalanobi's D square Statistic and give one of its use.
2. Write the relation connecting Hoteling's T square and Mahalanobi's D square Statistic.
3. How principal components are used in factor analysis?
4. Define Coincident profile.
5. Define canonical correlation.
6. Establish the relationship between Mahalanobi's D2 and linear discriminant function.
7. Explain the K-Mean method.
8. Define Dendogram.
9. Describe Hotelling-Lawley trace,
10. Explain Roy's Maximum Root Statistics

Part B

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

11. Show that Hoteling's T square is invariant under nonsingular linear transformations.
12. Explain the use of Hoteling's T square in testing the equality of means of two multivariate normal population.
13. Explain the term 'factor loading'. State the factor model and obtain the maximum likelihood estimates of the factor loadings.
14. Explain principal component analysis. Describe the iterative procedure to extract the first principal component.
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 Roy's Maximum Root Statistics and Hotelling-Lawley trace.
18. Define Rahu's statistics and Pillai's trace criterion.

Part C

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

19. Explain Fisher Behrens Problem for both equal sample and unequal sample.
20. What is Profile analysis? Explain how we test for (i) parallel profiles. (ii) coincident profiles, given that profiles are parallel. (iii) level profiles, given that profiles are coincident.
21. Describe the Agglomerative methods in cluster analysis.
22. Discuss in detail two way MANOVA