**QP CODE: 25022445**

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**Reg No :** .....

**Name :** .....

# M.Sc DEGREE (CSS) SPECIAL REAPPEARANCE EXAMINATION, APRIL 2025

## Third Semester

M.Sc STATISTICS

## CORE - ST500303 - MULTIVARIATE ANALYSIS

2019 ADMISSION ONWARDS

B6F4788C

Time: 3 Hours Weightage: 30

### Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Discuss the use of eigen values in Principal component analysis.
2. How we can find the confidence region for a multivariate mean vector from Normal Population?
3. *What are the uses of Hoteling's $T^2$ - Statistic?*
4. Define problem of classification with an example.
5. Describe the problem of linear discriminant analysis with an example.
6. Explain the term "communality" in factor modeling.
7. What you mean by specific factor in factor analysis?
8. What is divisive clustering methods?
9. Explain the wilk's statistics in likelihood ratio tests.
10. Offer your comments on the asymptotic distribution of the likelihood ratio criterion.

(8×1=8 weightage)

### Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain how principai components are used in factor anarysis.
12. Write a short note on Distribution of Hoteling's $T^2$.
13. Bring out the advantages of divisive methods over agglomerative procedures.

14. Explain the canonical correlation. Give any two applications of the same.

15. What is scree plot in PCA, give an example, what are its uses?

16. Derive Fisher's discriminant function and establish its relationship with Mahalanobis $D^2$.

17. Explain the procedure of classification, how it is related to discriminant analysis

18. Explain the Profile analysis with an example.

(6×2=12 weightage)

**Part C (Essay Type Questions)**

*Answer any **two** questions.*

*Weight **5** each.*

19. *Explain in detail with suitable justification, how will you test the equality of mean vectors of two multivariate normal populations with a common dispersion matrix, using a likelihood ratio criterion.*

20. Describe various hierarchical clustering methods.

21. Explain with suitable example single linkage und complete linkage and hierarchical clustering procedures.

22. Discuss in detail one way MANOVA.

(2×5=10 weightage)