M.Sc. DEGREE EXAMINATION,NOVEMBER 2018
II Year III Semester
Core Major -VII
APPLIED MULTIVARIATE ANALYSIS

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Write the Hotelling's T^2 test statistic.
2. State the sum of squares due to residual of two way multivariate analysis of variance.
3. What is the total population variance of the principal component?
4. State the orthogonal factor model with m common factors.
5. Define canonical correlation.
6. State the relationship between canonical coefficients of standardized and original variables.
7. Define discrimination.
8. What is optimum error rate?
9. What is single linkage?
10. What is non-hierarchical clustering technique?
11. State the total probability of misclassification
12. State the expected response at the i^{th} level of factor 1 and the k^{th} level of factor 2.

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. State the assumptions about the structure of the data for one way MANOVA.
14. State the MANOVA table for comparing 'g' population mean vectors.
15. What is factor loading?
16. Define first and second canonical variate pairs.
17. What makes classification a problem?
18. State the steps involved in K-means method.
19. State the allocation rule based on Fisherś discriminant function.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Let $X_1, X_2, \cdots X_n$ be random sample from $N_p(\mu, \Sigma)$population. Prove that the test based on T^2 is equivalent to the likelihood ratio test of $H_0 : \mu = \mu_0$ against $H_1 : \mu \neq \mu_0$.
21. Prove that the principal components are uncorrelated and have variances equal to the eigen values.
22. Explain the process of identifying the canonical variables.
23. Explain Fisher's linear discriminant function.
24. Explain Hierarchical clustering method.

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