M. Sc. (Sem. II) Examination

July - 2022

MS-203 : Applied Multivariate Analysis

Faculty Code : 003

Subject Code : 1172003

Time : **2½** Hours]   [Total Marks : **70**

1   Answer the following questions : (any **seven**)   **14**

 (1)   The gamma distribution is the multivariate counterpart of a _____ when the degrees of freedom are integers.

 (2)   The distribution of Hotelling's T-Square is _____

 (3)   The Canonical Correlation is a multivariate analysis of _____.

 (4)   Which clustering technique requires a merging approach ?

 (5)   Which is needed by K-means clustering ?

 (6)   Which function is used for K-means clustering ?

 (7)   The Wishart's distribution is a multivariate generalization of _____ distribution.

 (8)   Note down one application of Hotelling's T_2.

 (9)   If X_1, X_2, ... X_N be a random sample of size N from $N_p(\mu, \Sigma)$ then $\bar{X} \sim$ _____.

 (10) Write characteristic function of Wishart's distribution.

2   Answer the following questions : (any **two**)   **14**

 (1)   Write Assumptions of Factor Analysis.

 (2)   Explain Variations of the K-Means Clustering Method.

 (3)   Explain Principal component analysis.

3   Answer the following questions :   **14**

(1)   Explain Invariance Property of Maximum likelihood estimators.

(2)   Explain methods of Cluster analysis

OR

3   Answer the following questions :   **14**

(1)   Explain Sampling distribution of the Maximum likelihood estimators.

(2)   Derive Maximum likelihood estimators of parameters of Multivariate normal distribution.

4   Answer the following questions : (any **two**)   **14**

(1)   Obtain marginal distribution of Wishart's distribution.

(2)   Distinguish Factor Analysis and Principal Component Analysis.

(3)   Explain Maximum Likelihood estimator with example.

5   Answer the following questions : (any **two**)   **14**

(1)   Explain Principal component analysis.

(2)   State and prove that reproductive property of Wishart's distribution.

(3)   Explain the likelihood function in detail.

(4)   Write properties of the Wishart's Distribution.

———