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MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES (SOIS)
SECOND SEMESTER MASTER OF ENGINEERING - ME(Big Data and Data Analytics)
DEGREE EXAMINATION- APRIL / MAY 2017
Friday, 28, 2017
Time : 10:00 AM - 1:00 PM

Applied Multivariate Analysis [BDA 616.2]

Marks: 100   Duration: 180 mins.

Elective II

Answer all the questions.

1)   (a) What do you mean by multivariate analysis? Enumerate the advantages of multivariate   (10)
analyses over univariate analyses.

    (b) Let $Y = \begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \end{bmatrix}$ be a random vector with mean vector $\bar{Y} = \begin{bmatrix} 36 \\ 25 \\ 34 \end{bmatrix}$ and sample covariance

matrix $S = \begin{bmatrix} 65 & 33 & 47 \\ 33 & 46 & 28 \\ 47 & 28 & 60 \end{bmatrix}$. Find the mean and variance of $Z = 3Y_1 - 2Y_2 + 4Y_3$

(5+5= 10 marks)

2)   (a) What do you mean by discriminant function? What are the goals of discriminant analysis? (15)
(b) Describe discriminant analysis in case of five groups and 'p' number of
variables.   (5+10 = 15 marks)

3)   Discuss classification analysis when there are three groups with 10 measured variables.   (10)

4) (a) What do you mean by principal components? What are the objectives of principal component analysis? (20)
(b) Explain how do you derive the principal components and also the percentage of variation explained by
each of the components?
(c) Briefly explain the various methods to decide about the number of components that has to be retained?

(3+10+7 = 20 marks)

5)   (a) Explain any five methods of measuring the distance between two clusters in hierarchical   (20)
cluster analysis.
(b) Briefly describe K means clustering.

(15+5 = 20 marks)

6)   (15)

(a) Describe in detailed principal component method of extracting factors in factor analysis.

(b) Write a short note on factor rotation.

(10+5 = 15 marks)

7) Describe MANOVA. (10)