



NBW-003-017403 Seat No. _____

M. Sc. (Sem. IV) (CBCS) Examination

April / May - 2017

STAT. CST - 4003 : Multivariate Analysis

Faculty Code : 003

Subject Code : 017403

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) Attempt all questions.
(2) Each question carries equal marks.

1 Answer any **seven** of the following : **14**

- (1) In Wishart distribution, $p=1$ we obtain _____ distribution.
- (2) The limiting distribution of Negative Multinomial distribution when truncated at $X=0$ is _____
- (3) In Case, $K =$ _____ Multivariate Logarithmic Series distribution reduces to Logarithmic Series distribution.
- (4) _____ statistic is a generalization of Student's t -statistic.
- (5) Principal component analysis is _____ reduction technique.
- (6) If $\underline{X} \sim N_p(\mu, \varepsilon)$ define $\underline{Y} = C\underline{X}$ where C is a non-singular matrix then $\underline{Y} \sim$ _____
- (7) Hotelling's T^2 is _____ by the change of origin and scale.
- (8) Test based on _____ is Unbiased, UPM and Admissible.
- (9) The characteristic function of Wishart's distribution is _____
- (10) Hotelling's T^2 test has a _____ power function.

- 2** Answer the following questions : (Any Two) **14**
- (a) Explain non-singular multinomial distribution.
 - (b) Obtain multiple correlation coefficients for Non-singular multinomial distribution.
 - (c) Define multivariate normal distribution. In usual notations, determine the value of K .

- 3** Answer the following questions : **14**
- (a) Obtain moment generating function of negative multinomial distribution.
 - (b) Find the characteristic function of multivariate normal distribution.

OR

- 3** Answer the following questions : **14**
- (a) Explain negative multinomial Distribution.
 - (b) If p -component vector $Y \sim N_p(0, T)$ where T is non singular matrix then show that $Y' T^{-1} Y$ is distributed as χ_p^2 .

- 4** Answer the following questions : (Any Two) **14**
- (a) Find marginal distribution of multivariate logarithmic series distribution.
 - (b) Write the application of Hotelling's T^2 for q -sample problem.
 - (c) Discuss estimation of principal components.

- 5** Answer the following questions : (Any Two) **14**
- (a) Explain any three properties of Wishart's distribution.
 - (b) Explain principal components.
 - (c) Give the limiting distribution of negative multinomial distribution.
 - (d) Explain Mahalanobis- D^2 .