19STP06

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2022
(Second Semester)

Branch – **STATISTICS**

DISTRIBUTION THEORY

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1. _____ distribution is a conditional distribution that results from restricting the domain of some other probability distribution.
   (a) t (b) Truncated
   (c) limited (d) non-Truncated

2. The mean of non-central χ^2 distribution is _____.
   (a) $n+\delta$ (b) n-1
   (c) δ (d) n

3. The variance of multivariate normal distribution is given by _____.
   (a) σ (b) ρ
   (c) $\sum$ (d) ∞

4. _____ distribution is the generalization of univariate χ^2 distribution for two or more variables.
   (a) Laplace (b) Truncated
   (c) Cauchy (d) Wishart

5. _____ analysis is a statistical technique for data reduction technique.
   (a) Mean (b) Factor
   (c) Cluster (d) discriminant

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Obtain the mean of Truncated Binomial distribution.
OR
b What is Truncated Poisson distribution?

7 a Define Order Statistic.
OR
b What do you mean by non-central χ^2 distribution?

8 a Write the density function of multivariate normal distribution.
OR
b What is homogenous quadratic form?

9 a State the reproductive property of Wishart distribution.
OR
b Give one application of Hotelling's T^2 distribution.

10 a What is discrimination analysis and when it is used?
OR
b Define Canonical Correlation.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Derive Truncated Poisson distribution and find its moment generating function.

OR

b Explain the distribution function of sum, difference, product and quotient of random variables.

12 a Find the mean and variance of order statistic in uniform distribution U(0,1).

OR

b Derive non-central F-distribution.

13 a Find the distribution of quadratic function of multivariate normal variables.

OR

b Find the characteristic function of multivariate Normal distribution.

14 a Explain Hotelling's T^2 distribution.

OR

b Discuss in detail about Mahalanobis distance.

15 a Elaborate on Principle Component Analysis.

OR

b Write a detailed note on rotated matrix and factor loading in factor analysis.

Z-Z-Z END