SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Statistics - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - III
20USTCT3005 - Distribution Theory-II

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Discuss Exponential distribution and explain its variance?
2. Describe the first two moments of the Chi-Square distribution.
3. Apply the interrelationship between the t, F, and Chi-Square distributions in practical scenarios.
4. Illustrate the distribution of the ith order statistic and explain its significance in statistical analysis.
5. Compute the moment-generating function (MGF) of the Logistic distribution and explain its significance.
6. Relate the properties of the Chi-Square distribution and its applications in statistics.
7. Describe the t-statistic and relate it to the standard normal distribution.
8. Determine how to find the median using order statistics, and provide a practical example to illustrate your approach.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Explain the properties of the Cauchy distribution and derive its mean and variance.
10. Predict the relationship between the Weibull and Exponential distributions by computing their mean and variance and applying them in reliability studies.
11. Examine that the sample mean from a normal population follows a normal distribution.
12. Analyse the PDF of the F-statistic and deduce its mean and variance.
13. Let x_1, x_2, x_3, ... x_n be a random sample from a population with continuous density, show that y_{12} min(x_1, x_2, ... x_n) is exponential with parameter $n\lambda$ if and only if each x_i is exponential with parameter λ.

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