

**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. END SEMESTER EXAMINATION APRIL/NOV - 2021

SEMESTER - III

13USTCT3005 - Distribution Theory - II

Total Duration : 3 Hrs

MCQ : 30 Mins

Descriptive : 2 Hrs.30 Mins

Total Marks : 75

MCQ : 15

Descriptive : 60

Section B

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

1. Show that additive property of gamma distribution.
2. If $X \sim N(\mu, \sigma^2)$ obtain the PDF of $U = \frac{1}{2} \left[\frac{x-\mu}{\sigma} \right]^2$
3. Compute MGF of Exponential distribution (θ) and Find its variance.
4. Derive the rth moment about origin for double exponential distribution(α, β).
5. Compute moments of standard Weibull distribution(α).
6. Compute Mode and Skewness of χ^2 distribution.
7. Show that relation between t and F distributions.
8. Derive cumulative distribution function of a single order statistic.

Section C

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

9. If X and Y are independent gamma variates with parameters α and β respectively.
Show that the variates $U=X+Y, Z = \frac{X}{X+Y}$ are independent and that U is
 $Gamma(\alpha + \beta)$ variate and Z is a $\beta_1(\alpha, \beta)$ variate.
10. Let X and Y be the standard Cauchy variates prove that, the PDF of XY is
 $\frac{2}{\pi^2} \left\{ \frac{\log|x|}{x^2-1} \right\}.$

Contd...

11. Derive the PDF of χ^2 distribution.
12. Derive the PDF of F- distribution.
13. Derive the joint PDF of n^{th} order statistics.