

Roll.No.

22UDSAT4004

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. Cs with DS - END SEMESTER EXAMINATIONS - NOVEMBER 2025  
SEMESTER - IV

**22UDSAT4004 - Allied Statistics II**

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

### Section B

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

1. Define the following basic concepts of probability with suitable examples:
  - a) Random experiment
  - b) Sample space
  - c) Trial
  - d) Event
2. Write the probability density function of a normal distribution. State its mean, variance.
3. Define the Chi-square distribution and relate its connection with the variance of a normal population.
4. Explain Type I and Type II errors with an example.
5. State the probability mass function, mean, and variance of a Binomial distribution.
6. Define probability density function and cumulative distribution function for a continuous random variable. Examine its properties.
7. Define the Student's t-distribution and list its properties.
8. Explain the concept of ANOVA. Illustrate and organize with examples.

### Section C

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

9. Describe different types of events with examples:
  - a) Exhaustive events
  - b) Mutually exclusive events
  - c) Equally likely events
  - d) Independent events
10. Define Poisson distribution. Compute its mean and variance.

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11. Examine the probability density function of Exponential distribution. Derive its mean and variance.
12. If  $X_1, X_2, \dots, X_n$  are independently and identically distributed from  $N(\mu, \sigma^2)$ , compute the distribution of the sample mean  $\bar{X}$ .
13. a) Assess the Chi-square test for independence and give an example from a  $2 \times 2$  contingency table.  
b) Evaluate the procedure of proportion test.

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