

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.Mathematics - END SEMESTER EXAMINATIONS - APRIL 2025

SEMESTER - III

**20UMAAT3003 - Mathematical Statistics - I**

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

### Section B

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

1. Explain the classical, statistical, and axiomatic definitions of probability with suitable examples.
2. Classify the types of moments and mention one use for each.
3. Solve for the third central moment of a given Binomial distribution.
4. Determine the mean and variance of Gamma distribution.
5. List any two properties of a distribution function.
6. Apply the multiplication theorem for expectation in a simple case.
7. Describe the main features of the Normal distribution (statement only).
8. Distinguish between Beta distributions of the first and second kinds.

### Section C

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

9. State and prove Bayes' theorem.
10. Relate the concept of independence of random variables to their joint and marginal distributions using a suitable example.
11. Infer the significance of Chebyshev's inequality in probability theory with statement and proof.
12. Obtain the mean, variance and moment generating function of Poisson distribution.
13. Ascertain the mean and variance of a uniform distribution by integrating its probability density function.

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