

B.A/B. Sc-I Semester-I

Paper-II (ST-102)

Time: 3 Hours

M.M.:B. Sc: 40+10*

B.A: 28+7*

* Internal Assessment

Probability Theory

Note : There will be nine questions in all. Question No.1 will be compulsory covering whole of the syllabus and comprising 5 to 8 short answer type questions. Rest of the eight questions will be set from the four units uniformly i.e. two from each unit. The candidate will be required to attempt five questions in all selecting one question from each unit and the compulsory one. All the questions will carry equal marks except the compulsory question, the distribution of marks for which will be as follows:-

B.Sc.8 marks and B.A. 6 marks.

UNIT-I

Concepts in Probability: Random experiment, trial, sample point, sample space, operation of events, exhaustive, equally likely and independent events; Definition of probability-classical, relative frequency, statistical and axiomatic approach.

UNIT-II

Conditional probability. Addition and multiplication laws of probability and their extension to n events. Boole's inequality; Baye's theorem and its applications.

UNIT-III

Random Variable and Probability Functions: Definition of random variable, discrete and continuous random variable, probability function, probability mass function and probability density functions, distribution function and its properties, functions of random variables, joint, marginal and conditional probability distribution function.

Mathematical Expectation : Definition and its properties- moments, addition and multiplication theorem of expectation. Conditional expectation and conditional variance.

UNIT-IV

Generating Functions: Moments generating function, cumulant generating function, probability generating function along with their properties.

Books recommended

S. No.	Title of Book	Name of author	Publisher
1.	Fundamentals of Mathematical Statistics	Gupta S.C.& Kapoor V.K.	Sultan Chand & Sons
2.	Probability for Statistical Decision Making	Edward P.J., Ford J.S. and Lin	Prentice Hall
3.	Elementary Probability	David S.	Oxford Press
4.	Introduction to Mathematical Statistics	Hoel P.G.	Asia Pub. House
5.	New Mathematical Statistics	Bansi Lal & Arora S.	Satya Prakashan
6.	Introduction to Mathematical Statistics	Hogg and Craig	Prentice Hall