

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

### Paper-I (ST-201)

Time: 3 Hours

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

B.A: 28+7\*

\* Internal Assessment

### Statistical Methods-II

**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

**Correlation** : Concept and types of correlation, methods of finding correlation - scatter diagram, Karl Pearson's Coefficient of correlation ( $r$ ), its properties, coefficient of correlation for a bivariate frequency distribution. Rank correlation with its derivation, its merits and demerits, limits of rank correlation coefficient, tied or repeated ranks.

#### UNIT-II

**Curve Fitting** : Principle of least squares, fitting of straight line, second degree parabola, power curves of the type  $Y=aX^b$ , exponential curves of the types  $Y=ab^X$  and  $Y=ae^{bX}$ .

#### UNIT-III

**Linear Regression** : Two lines of regression, regression coefficients, properties of regression coefficients, angle between two regression lines, standard error of estimate obtained from regression line, correlation coefficient between observed and estimated values, distinction between correlation and regression.

#### UNIT-IV

**Multiple Regressions for Three variables**: Plane of regression, properties of residuals, variance of the residual. Multiple and partial correlation coefficients: coefficient of multiple correlation and its properties, coefficient of partial correlation and its properties, multiple correlation in terms of total and partial correlations coefficient of determination.

### **Books recommended**

<b>S. No.</b>	<b>Title of Book</b>	<b>Name of author</b>	<b>Publisher</b>
1.	Introduction to Theory of Statistics	Mood A.M., Graybill F.A. & Boes D.C.	McGraw Hill
2.	Applied General Statistics	Croxton F.E., Cowden D.J. & Kelin S.	Prentice Hall
3.	Basic Statistical Computing	Cooke, Cramar & Clarke	Chapman & Hall
4.	Statistical Methods	Snedecor G.W. & Cochran W.G.	Lowa State Uni. Press
5.	Fundamentals of Mathematical Statistics	Gupta S.C.& Kapoor V.K.	Sultan Chand & Sons

## **B.A/B. Sc-I Semester-II**

### **Paper-II (ST-202)**

Time: 3 Hours

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

B.A: 28+7\*

\* Internal Assessment

### **Probability Distributions**

**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**

Bernoulli distribution and its moments, Binominal distribution: Moments, recurrence relation for the moments, mean deviation about mean, mode, moment generating function (m.g.f), additive property and recurrence relation for the probabilities of Binominal distribution.

#### **UNIT-II**

Poisson distribution: Poisson distribution as a limiting case of Binomial distribution, moments, mode, recurrence relation for moments, m.g.f., additive property of independent Poisson variates. Negative Binominal distribution: m.g.f., deduction of moments of negative binominal distribution from those of binominal distribution. Geometric distribution: moments and m.g.f.

#### **UNIT-III**

Continuous uniform distribution: Moments, m.g.f., and mean deviation. Gamma distribution: m.g.f., and additive property. Exponential distribution: m.g.f., moments and lack of memory.

#### **UNIT-IV**

Normal distribution as a limiting form of binominal distribution, chief characteristics of Normal distribution; mode, median, m.g.f. and moments of Normal Distribution, A linear combination of independent normal variates, points of inflexion, mean deviation about mean, area property of Normal distribution, importance and fitting of normal distribution.

### **Books recommended**

<b>S. No.</b>	<b>Title of Book</b>	<b>Name of author</b>	<b>Publisher</b>
1.	Statistics:A Beginner's Text Vol. II	Bhat B.R., Srivenkatramana T. & Rao Madhava K.S.	New Age International
2.	Fundamentals of Mathematical Statistics	Gupta S.C. & Kapoor V.K.	Sultan chand & Sons
3.	Introduction to Mathematical Statistics	Kapoor & Sexena.	Schand
4.	Statistics	Johnson R.	Wiley Publishers
5.	Mathematical Statistics With Applications	Freund's J.E.	Prentice Hall

**Practical**

Note: Five questions will be set. The candidate will be required to attempt any three.

1. To construct frequency distributions using exclusive and inclusive methods
2. Representation of data using Bar and pie diagrams
3. Representation of data using Histogram, Frequency Polygon, Frequency Curve and Ogives.
4. To toss a coin at least 100 times and plot a graph of heads with respect to number of tosses.
5. To compute various measures of central tendency and dispersion.
6. To obtain first four moments for the given grouped frequency distribution.
7. To apply Charlier's checks while computing the moments for a given frequency distribution.
8. To obtain moments applying Sheppard's correction.
9. To obtain various coefficients of skewness and kurtosis.
10. To discuss the association of attributes for a 2x2 contingency table using Yule's coefficient of association and colligation.
11. To compute Karl Pearson's coefficient of correlation for given bivariate frequency distribution.
12. To find Spearman's rank correlation coefficient for given data.
13. To fit the straight line for the given data on pairs of observations.
14. To fit the second degree curve for the given data.
15. To fit the curve of the type  $Y = aX^b$  for the given data on pairs of observations.

16. To obtain the regression lines for given data.
17. To compute partial and multiple correlation coefficients for the given trivariate data.
18. To obtain plain of regression for the given trivariate data.
19. To fit binomial distribution to given data.
20. To fit Poisson distribution to given data.
21. To fit normal distribution to given distribution using area under the normal curve.
22. To fit normal distribution to given distribution using method of ordinates.

**Distribution of marks:**

	<b>B. Sc.</b>	<b>B.A</b>
<b>Class Record:</b>	<b>10</b>	<b>06</b>
<b>Viva Voce:</b>	<b>10</b>	<b>06</b>
<b>Practical:</b>	<b>80</b>	<b>48</b>