

## STATISTICS MINOR

### STAT-H-MC2-2-Th

3 Credits

#### **(Descriptive Statistics II & Probability II)**

**THEORY**

*Bivariate data:* Definition, scatter diagram, simple correlation, linear regression, principle of least squares, fitting of polynomial and exponential curves, correlation ratio, correlation index, intra-class correlation.

*Rank correlation:* Spearman's and Kendall's measures. (15)

*Analysis of Categorical Data:* Contingency table, Independence & association of attributes. (5)

*Random Variables:* Definition of discrete and continuous random variables, cumulative distribution function (c.d.f.) and its properties (without proof), probability mass function (p.m.f.) and probability density function (p.d.f.). Expectation and Variance.

*Standard probability distributions:* Discrete Uniform, Binomial, Poisson, and Normal. (25)

### STAT-H-MC2-2-P

1 Credit

#### **(Descriptive Statistics II & Probability II)**

**PRACTICAL**

#### **List of Suggested Practical**

- Problems based on analysis of bivariate data.
- Problems based on measures of rank correlation.
- Problems based on analysis of categorical data.
- Finding expectation, variance from a given probability distribution.
- Fitting of binomial distributions for  $n$  and  $p=q=1/2$ .
- Fitting of binomial distributions for given  $n$  and  $p$ .
- Fitting of binomial distributions after computing mean and variance.
- Fitting of Poisson distributions for given value of mean.
- Fitting of Poisson distributions after computing mean.
- Application problems based on binomial distribution.
- Application problems based on Poisson distribution.
- Problems based on area property of normal distribution.
- To find the ordinate for a given area for normal distribution.
- Application based problems using normal distribution.
- Fitting of normal distribution when parameters are given.
- Fitting of normal distribution when parameters are not given.

### **Reference Books:**

- Goon, A.M., Gupta, M.K. and Dasgupta, B.: Fundamentals of Statistics, Vol. I, The World Press, Kolkata.
- Goon, A.M., Gupta, M.K. & Dasgupta, B.: An Outline of Statistical Theory (Vol-1), World Press.
- Miller, Irwin and Miller, Marylees: John E. Freunds Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
- Mood, A.M., Graybill, F.A. and Boes, D.C.: Introduction to the Theory of Statistics, 3<sup>rd</sup> Edn. (Reprint), Tata McGraw-Hill Pub. Co. Ltd.
- Tukey, J.W.: Exploratory Data Analysis, Addison-Wesley Publishing Co.
- Agresti, A.: Analysis of Ordinal Categorical Data, 2nd Edition, Wiley.
- Freedman, D., Pisani, R. and Purves, R.: Statistics, 4th Edition, W. W. Norton & Company.
- Chung, K.L.: Elementary Probability Theory with Stochastic Process, Springer/Narosa.
- Feller, W.: An Introduction to Probability Theory & its Applications, John Wiley.
- Parzen, E.: Modern Probability Theory and its Applications, John Wiley.
- Uspensky, J.V.: Introduction to Mathematical Probability, McGraw Hill.
- Cacoullos, T.: Exercises in Probability, Narosa.
- Rahman, N.A.: Practical Exercises in Probability and Statistics, Griffin.
- Ross, S.: A First Course in Probability, Prentice Hall.
- Hogg, R.V., Tanis, E.A. and Rao J.M.: Probability and Statistical Inference, Seventh Ed, Pearson Education, New Delhi.
- Myer, P.L.: Introductory Probability and Statistical Applications, Oxford & IBH Publishing, New Delhi.
- Rohatgi, V. K. and Saleh, A.K. Md. E.: An Introduction to Probability and Statistics. 2<sup>nd</sup> Edn. (Reprint) John Wiley and Sons.
- Roychowdhury, S., Bhattacharya, D.: Statistics Theory and Practice, U.N. Dhur & Sons. Pvt. Ltd.