

### 10. APPLIED STATISTICS

Scheme:	Duration	Max Marks		Min. Pass Marks	
		Sc.	Arts	Sc.	Arts
Paper- I	3 hrs.	50	65	18	24
Paper-II	3 hrs.	50	65	18	24
Paper-III (Practical)	3 hrs.	50	70	18	25
Total		150	200	54	72

Note: In each question paper, 10 (Ten) questions will be set having 2 (Two) from each unit. Candidates have to answer five questions in all taking not more than one from each unit.

#### Paper I : Probability Theory

Unit I: Functional relationship between two variables, Polynomials, exponential logarithmic & Binomial functions and their expansions. Infinitesimal quantity. Idea of permutation and combination. Notion of limits. Rules for finding limits. Continuity, Differential Coefficient and its physical interpretation as a rate measure. Standard results for differential coefficients of  $x^n$ ,  $e^x$ ,  $\log x$  etc. (without proof). Rules for differentiation of sum, difference, product and quotient and function of a function (without proof). 18 hours

Unit II. Maxima and Minima. Integral Calculus: Definition and meaning of integration. General laws of integration, Integration of a continuous function. Definite integration. 18 hours

Unit III. Important Concepts of Probability: Random Experiment, Trial, Events and their types. Classical and Statistical definitions of Probability. Sample point and sample space. Axiomatic Approach to Probability and its properties. Addition and Multiplication theorems of probability. Conditional Probability. Baye's Theorem and its Applications (Simple Problems only). Chebychev's Inequality and its applications. 18 hours

Unit IV. Random Variable: Probability Mass Function, Probability Density function. Distribution Functions. Joint Probability Distribution, Marginal and Conditional Probability distribution (Continuous and Discrete case). 18 hours

Unit V. Mathematical Expectation : Expectation of a random Variable and its properties. Addition and Multiplication Theorems of Expectation. Conditional Expectation. Definition of Variance and Covariance, Moments, Skewness and Kurtosis. Moment Generating Functions and their simple properties. Definitions of Binomial Distribution, Poisson Distribution, Normal Distribution, Gamma Distribution, Beta Distribution & their mean, Variance & mfg. 18 hours

#### References

1. Bhatt B.R. Srivenkatramanna T and Rao Madhava K.S. (1997) : Statistics : A Beginner's Text, Vol. II, New Age International (P) Ltd.
2. Goon A.M., Gupta M.K., Das Gupta B. (1991) : Fundamentals of Statistics, Vol. I & II, World Press, Kolkata.
3. Kapoor V.K. & Gupta S.C. : Fundamentals of Mathematical Statistics, Sultan Chand and Sons, New Delhi.
4. Mood A.M. Graybill F.A. Boes D.C. (1974) : Introduction to the theory of statistics, McGraw Hill.

#### Additional References :

1. Hoel P.G. (1971) : An Introduction to Mathematical Statistics, Asia Publishing House.
2. David S. (1996) Elementary Probability., Oxford Press.
3. Cooke, Cramer and Clarke : Basic Statistical Computing, Chapman and Hall.
4. Meyer P.L. (1970) : Introductory Probability and Statistical Applications. Addison Wesley.

#### Paper II : Descriptive Statistics

(The course contents are same as that of Subject-Statistics)

#### Paper III : Practical Paper

(The course contents are same as that of Subject-Statistics)