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 **STATISTICS**

**CURRICULUM OF STATISTICS FOR B. Sc, (PASS)**

**(FOR THE ACADEMICYEAR 2011 ONWARDS)**

There will be 04 four papers (Theory and Practical) in Statistics at B. Sc (Pass) College side. 02 Theory and 02 Practical courses will be taught in the first year of teaching and 02 courses in 2nd year of Teaching.

**Paper- I Fundamental Statistics Marks 100**

**Five Questions to be attempted, at least two from each section**

**Section-A**

Definition of Statistics is scope and limitations. Statistical data, nature and sources of data, Qualitative and quantitative data. Classification and Tabulation methods. One way and tow way classification. Graph and diagrams. Frequency distribution, relative and cumulative frequencies. Characteristics of frequency distributions. Measures of location and desperation for ungrouped and grouped data. Moments, measure of Skawness and Kurtosis. Shepherd’s correlation. Charlie’s check.

**Section- B.**

**Interpolation:** Interpolation by graph; Difference operators and their properties. Newton’s forward and backward formulae. Newton’s divided difference formula, Lagrange’s formula, Direct and inverse Interpolation. Central difference formula, (Gauss, Stilling, Bessel). Use of Programmers and Computers.

**Financial Statistics**: Progressions, geometric Progression, simple and compound interests, sinking funds, annuities, mortgage, terminal values, discounting, application to depreciation and investment analysis.

Time Series: Components of time series. Methods of isolation of these components. Concepts of cycle, Trend, Seasonal and Random Moments, Method of projection and estimation. Uses of time series data in evaluation of G.N.P., N.N.P. inflation and Deflation.

Index Numbers: Type of Index numbers, Methods of construction of simple and weighted Index number. Choice of Base year, type of average to be used. Lapeyer’s Pasche’s Fisher and Marshal Edgrowth Index Number. Consumer price index (cost of living Index). Shifting of Base. Test of index Number in daily life and official Statistics.

**Practical- I marks -50**

1. Presentation of data by diagrams (Simple, Multiple, Subdivided bars, Rectangles, Squares, Cubes, Circle, Pie diagram, Box & Whisker, Stem & leaf Plots).
2. Graphical Presentation of Frequency data, Frequency Polygon, Curves, Histograms, cumulative Frequency Curves.
3. Preparation of Frequency distribution (Discrete and continuous).
4. Calculation of Measures of location, Qualities for ungrouped as well as grouped data. Location of Mode and Quintiles by graphical method.
5. Calculation of Q.D., M.D., S.D. absolute and relative measures of Dispratio.
6. First 4, months, B1 and B2, skewness and Kurtosis by empirical method.
7. Construction of index Numbers, Simple, Weighted, Laspeyer, Pasches, Fisher, Marshal, Edge worth. Application and their tests.
8. Extraction of Trend, seasonal variation from time series by all four methods, Graphical presentation of time series data.
9. Interpolation, forward, backward, graphical and mathematical applications of Newton’s formulae, Language’s formulae, Central Difference formulae, Gausses, Sterling, Bessel.
10. Computer Programs (BASIC).
11. Problems on Financial Mathematics.

**Text Books:**

1. Croxton, F.E. & Cowden D.J (1964); Applied General Statistics. Prentice- Hall Inc, New York.
2. Freund, J.E and Williams F.J (1973); Modern Business Statistics. Prentice- Hall Inc, New York.
3. Walpole, R.E (1982); Introduction to Statistics, Macmillan Publishing Co. Inc, New York.
4. Bancroft G.O Sullivan, G. (1981); Mathematics and Statistics for Accounts and Business Studies, McGraw Hill, New York.
5. Dixon W.J and Massey F.J (1985); Introduction to Statistical Analysis, McGraw Hill, Book Co. London.
6. Yle, G.U & Kenall, M.G (1991); An Introduction to the theory of Statistics. Charles Griffin & Co. Ltd. London.
7. Mason, R.D Lind, D.A and Marchal, W.G (2001); Statistical Technique in Business and Economics. McGraw Hill, New York.
8. Burden, R.L and Fairs J.D (2005); 8th Edition; Numerical Analysis, prindle, Weber and Schmidt, Boston.

**PAPER-II PROBABILITY AND APPLIED STATISTICS 100 marks**

**Five Questions to be attempted, at least two from each section**

**Section-A**

Definition of Probability. Simple laws of Probability. Combinatorial Problems, Conditional Probability, Rays Theorem with Proof and Applications. Statistical Independence, (Pair Wise and Mutual). Discrete Random Variable. Probability Mass Function. Mathematical Expectation of Random Variable and Simple Functions of Random Variables. Generating Functions (Recurring Series). Moment Generating Function. Cumulating Generating Function with their Properties. Discreet Probability Distributions; Binomial Poisson, Geometric and Hyper-Geometric Distributions, Derivations of Mean, Variance, Moments, (B1) (B2) of the Above Distributions.

**Section –B**

Official Statistics, Quality of Statistics, generation of official Statistics, peculiarities and properties of official Statistics limitation of Official Statistics, errors in Official Statistics, Method of elimination of errors and mistakes. Sources of Official Statistics in Pakistan. Type of Statistics available, Setup of Major Statically Organizations in Pakistan, (Federal Bureau of Statistics, Provincial Bureau of Statistics, and State Bank of Pakistan) Agricultural, Population, Banking, Economics and General Statistics Series. National and International Classifications.

Sources of Demographics Data. Graphical and Numerical Studies of Demographic Data. Calculation of Vital Rates and Ratio (Mortality and Fertility). Crude and Specified Rates. Rates of Natural Increase (Simple and Geometric); Standardized Death Rates T.R.R, G.R.R, N.R.R, Simple Life Table. Basic Concept of Quality Control and International Quality Standards, X Bar and R, and X Bar and O, Charts.

**Practical- II marks -50**

1. Generation of Discrete probability distribution. Coin tossing, and Dice throwing experiments through Random number table.
2. Comparison of moments of empirically generated data with their corresponding theoretical moments.
3. Fitting of Binomial poison, Geometric, Hyper geometric distribution to reserved data.
4. Extraction of information and official publications.
5. Coding and Editing of Schedules.
6. Calculation of mortality rates
7. Calculation of fertility rates
8. Calculation of Replacement Indices.
9. Graphical presentation of census and Registration data for Demographic studies. Population pyramids.
10. Life table construction.
11. Problem on control charts X bar & R and X bar and O charts.

 **Text Books:**

1. Zarkovich, S.S (1966); Quality of Statical Data; Food and Agriculture Organization, United Nation. Rome.
2. Md, Fassihuddin (1968); Mathematical Statistics, , Vol. I, Library promotion Bureau, Univ. of Karachi.
3. Walpole, R.E (1982); Introduction to Statistics, Macmillan Publishing Co. Inc. New York.
4. Masoodul Haq (1984); Foundation of Probability & Statistics. Tahir Sons Karachi.
5. Federal Bureau of Statistics, Various Annual and Quarterly Publication of Federal Bureau of Statistics of Pakistan.
6. Pollard, A.H., Pollard G.N., And F. Yousf (1990); Demographic Techniques, Pergamum Press.
7. Montgomery, D.C (2009); 6th Edition; Introduction of Statistical Quality Control, McGraw Hill, New York.
8. Ross, S. (2009); 6th Edition; A First Course in Probability, Maxwell Macnitan Inc. New York.

Statistics

There shall be two theory papers and two practical of 100 marks and 50 marks each respectively One theory and practical examination shall be held in part –I and one practical examination shall be held in part-II

Part-I Theory Paper of 100 Marks

General nature and scope of statistical work tabulation and handling of data Graphical representation and bvariate frequency distribution with continuous and discontinuous variates.

Elementary Ideas of statistical population and random samples measures of central tendency and dispersion their characteristics properties and relationship means of means Quartile deviation mean deviation standard deviation coefficient of variation standard deviation coefficient variation of skewness kurtosis moments relation between moments about origin and mean Charlie’s check .Sheppard’s correction .Binominal and poisson Distributions with their derivations properties and fitting of statistical data Normal Curve .The probability integral and its uses General idea of association of attributes contingency and correlation , 2 test.

General Idea of Regression Partial and Multiple Correlations

Permutations and combination, elements of the Probability, addition and multiplication theorem repeated trials law of large numbers.

Interpolation and Extrapolation with equal and unequal intervals ,Inverse Interpolation.

**Part –I Practical Examination of Marks**

Illustration of data by various types of diagram .Tabulation and frequency distribution illustration of various types of frequency distribution calculation and Graphical illustration of median and percentiles central tendency measures and relationship between them measures of dispersion moments skewness and Kurtosis.

Binominal distribution poison distribution scatter diagram and regression coefficients correlation (ungrouped and grouped) Multiple and partial correlation normal distribution probability integral and its uses. Interpolation consistence of data and independence and association of attributes 2 test and goodness of fit.

 **Maximum Marks**

Practical Note Book 10

Viva Voce 10

Piratical paper 30

**Total 50**

**Paper –II (100 Marks )**

**Theory**

 Index Numbers and their construction Weighted and cost of living index tests of index numbers Tests of index Number detailed study of weighted index number including those business activities quantity index numbers.

Times series analysis of time series determination of trends fluctuations semi averages moving averages and smoothing of data .correction of times series measurement of short time oscillation by different methods.

Psychometric Methods : Mental measurement intelligence , Quotient reliability and validity of tests spearmen Brown prophecy z& T scores.

Sampling : structure of various types of samples Random , stratified ,systematic Multi stage Multiphase ,cluster Lin4e and Quota sampling sample surveys Basic Ideas of sequential sampling .

Curve Fitting ; Linear Quadratic and cubic curve by latest square methods semi logarithmic double Logarithmic curve Exponential ad Modified curves Logistic and pareto curves.

Significance of two means and Correlation coefficients.

Elementary Experimental Design Ungrouped Randomized design Randomized Block Design Incomplete Block Design. Analysis of Variance.

**Part –II Practical**

Construction of Index Number , simple aggregative Lapspyeres Formula pas-ehes Formula Fisher Ideal Formula tests analysis of time series semi average Moving average Least square Method Corellation of Time Series Psychometric Methods spearmen –Brown prophecy formula Reliability and Valitidy of tests sampling ,simple Random sampling ,Various methods semi

cubic curve by least square method semi logarithmic curve , Double logarithmic curve logistic and Pareto Curve ,analysis of Variance .

The Distribution of Marks shall be as Under:

**Maximum Marks**

Practical Note Book 10

Viva Voce 10

Piratical paper 30

**Total 50**

**M.A Final PAPER**

 **SOCIAL STATISTICS**

1. **Introduction**
2. Meaning and definition of social statists.
	1. Use of statists in modern sociology
	2. Grouped and un-grouped data
	3. Descriptive and inductive statists
	4. Scale nominal ordinal interval and ratio
	5. Problems of measurement in statists

**2. Measure of central tendency**

2.1 Mean, medicine and mode

2.2 Quartiles deciles and percentiles

**3. Measure of dispersion**

 3.1 Range

 3.2 Mean deviation

 3.3 Standard deviation

 3.4 Variance

 3.5 Quartiles deviation

**4. Probability**

 4.1 Basic concepts

 4.2 Rules of Probability

 4.3 Theory of probability in long range interpretation of data.

**5. The normal distribution curve**

 5.1 Forms of normal curve

 5.2 Area under the normal curve

**6. Test of significance**

 6.1Single sample tests involving means and proportions

 6.2 Two sample tests

 6.3 Difference of means and proportion.

**7. Non parametric tests**

 7.1 Chi square test

 7.2 Other non parametric tests

**8. Correlation and regression**

 8.1 Methods and forms of correlation

 8.2 Personal correction

 8.3 Partial and multiple correlations

 8.4 Rank order correlation

 8.5 Regression analysis in sociology

**9. The analysis of variance**

 9.1 One way analysis of variance

 9.2 Statistical inference and computer application

**Books Recommended.**

1. Block Hubert M. J r(1988) Social statistics: Tokyo: McGraw Hill Book Company Kangajysga Ltd (International Studies Edition)
2. Brace Charles hurry and Braes. Corrinne Fellillo(1978) understandable statistical, Concepts and Methods Massachusetts: D.C health and company.
3. By kit, Donal R (1972), Elements of Statistic An introduction to Probability and Statistical inference New York Van Nostracnd Reinhold Company.
4. Edward Allen L 1966 Statistical methods for Behavioral Science New York Rinehart and Company, Inc
5. Elhance D.N (Latested) Fundamentals of statistical Allahabad Kitab Mahal,
6. Elifson Kirk W, Richard P, Runyon and Audery Haber, (1990). Fundamental of Social statistics, (2nd ads) Singapore, Me Grew Hill Book Company Inc.
7. Haloed M,J and Ensile, price Daniel O Statistics for Sociologists (Received edition) New York Holt Rinehart and Winston.