

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-I.
Semester - I
Paper No : 104

ADVANCED STATISTICS - 1

(Syllabus effective from Academic Year 2010-11 onwards)

(1) Statistical Inference

(50%)

Estimation

Estimation, Different measures of closeness of an Estimation, some properties of estimators; consistency, unfussiness and efficiency Method of estimation. Maximum Likelihood estimation and it's properties (without proof). Method of maximum likelihood, method of moments, method of chi-squares. Confidence intervals. Method of finding confidence intervals, large sample confidence intervals, confidence intervals for parameter. Elementary distributions.

(2) Univariate Distributions :-

(50%)

Introduction, important properties and application of (i) Hyper Geometric distribution (ii) Negative Binomial distribution (iii) Cauchy distribution (iv) Laplace distribution (v) Log-Normal distribution.

BOOKS :

1. Johnsons, N .L. and Kotz, S. (1977) : Distribution in Statistics, John Wiley.
- ✓ 2. Ferguson, T.(1967) : Mathematical Statistics; Academic Press.
3. Jaiswal, M.C. (1973) : Statistics Distributions; Guj.Uni. Book Pub. Board, Ahmedabad.
- ✓ 4. Rohatgi, V.K (1984) : Introduction to Probability Theory and Mathematical Statistics; Wiley Eastern.
- ✓ 5. Gibbons, J.D. (1976) : Non-Parametric Methods for Quantitative Analysis; Holt, Rinehart and Winston.
6. Sidney Seigal (1956) : Non-Parametric Methods for Behavioral Sciences; Mac-Graw Hills.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-I.

Semester - I

Paper No : 105

ADVANCED STATISTICS - 2

(Syllabus effective from Academic Year 2010-11 onwards)

Demography (1):-

(50%)

Meaning and scope of demography, history and growth of demography, uses, limitation and suggestion of vital statistics, measures of mortality rates: Crude death rate, Specific death rate, Standardized death rate, Comparison of two cities by proper mortality.

Fertility rates : Crude Birth rate (CBR), General fertility rate (GFR), Specific fertility rate (SFR), Total Fertility rates (TFR), Explanation and calculation of fertility rates.

Reproduction rates: Gross Reproduction Rate(GRR), Net Reproduction Rate (NRR), explanation and calculation of reproduction rates, Population projection - methods, importance and limitation.

Index Numbers:-

(50%)

Meaning and definition of Index numbers, uses and limitation of Index numbers, basic problem involved in construction of Index numbers. Various types of Index numbers - Simple aggregate, Weighted aggregate, Laspere's price, Paasche's price, Bowley's price, Marshall Edge worth price, Fisher's Index numbers, Measurement of price and quantity Index numbers, Time reversal and Factor reversal tests, Construction and importance of cost of living index numbers.

BOOKS :

- ✓ 1. Pathak, K.B. and Ram, R.(1992) : Techniques of Demographic Analysis Himalaya Pub. House, Delhi.
- ✓ 2. Jaiswal, M.C. (1984) : Arth Vishayak ankadashashtra (in Gujarati); University Granth Nirmal Board, Ahmedabad.
- 3. Srivastava, O.S. (1983) : A Textbook of Demography; Vikas Publishing House.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-I.

Semester - I

Paper No : 106

ADVANCED STATISTICS - 3

(Syllabus effective from Academic Year 2010-11 onwards)

(1) Mathematical Economics :

(50 %)

Nature, meaning and scope of Econometrics.

Distinction between Statistics & Econometrics.

Concept of utility function and indifference curves.

Demand, Compensated demand function.

Production function, Formulation of a production function.

Elasticity of substitution for two input factors of production, Cobb-Douglas production function, CES production function & methods of estimation of their parameters,

Formulation of a consumption function, Leontief's input-output analysis, open and closed models and its importance in inter-industry relations. Cross section and time series.

Estimation of their parameters.

(2) Time Series Analysis :

(50 %)

Concept of Time series analysis. Fitting of curves by method of least squares. Fitting of linear equations. (Theoretically). its applications. Fitting of parabolic, $y = ab^x$, $y = ae^{bx}$ curves with application (examples). Computation of seasonal variation. Regular and irregular variations by the method Ratio to Trend, by Moving Average, Ratio to trend by straight line, by method of least squares.

BOOKS :

✓ 1. Allen R.G.D.:(1973) Mathematical Analysis for Economics.

✓ 2. Box and Jenkins.:(1970) Time Series Analysis, Holden-Day publications.

3. Jaiswal M.C.(1964) .: Artha Vishayak Ankdeshashtra (in Gujarati) Uni. Granth Nirmal Board, A'bad.

4. Handerson, M.A. & Quandt (1980):: Micro Economics Theory/Mathematical Economics, Mac-Graw Hills.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-I.

Semester - II

Paper No:204

ADVANCED STATISTICS - 4

(Syllabus effective from Academic Year 2010-11 onwards)

(1) Testing of Hypothesis

(50%)

Statistical hypotheses, critical region, two types of errors, level of significance, power of a test, Neyman Pearson's lemma (without proof) and its applications (Binomial, Poisson, Normal and Exponential distributions). The most powerful test of a simple hypothesis against a simple alternative.

(2) Non-parametric Tests :-

(50%)

Introduction, Comparison of parametric and non-parametric tests, run test for randomness, Kolmogorov - Smirnov test of goodness of fit, extension of Median test, Kruskal - Wallis test (one way Analysis of variance), Rank correlation, Kendall's Rank correlation.

BOOKS :

1. Jaiswal, M.C. (1973) : Statistics Distributions; Guj.Uni. Book Pub. Board, Ahmedabad.
2. Rohatgi, V.K (1984) : Introduction to Probability Theory and Mathematical Statistics; Wiley Eastern.
3. Gibbons, J.D. (1976) : Non-Parametric Methods for Quantitative Analysis; Holt, Rinehart and Winston.
4. Sidney Seigal (1956) : Non-Parametric Methods for Behavioral Sciences; Mac-Graw Hills.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-I.

Semester - II

Paper No: 205

ADVANCED STATISTICS - 5

(Syllabus effective from Academic Year 2010-11 onwards)

Demography (2):

(30%)

Life tables:- Assumptions, Constructions, uses and limitations Numerical examples to life tables. Fitting of logistic curve - Theory and examples.

Indian Official Statistics:

(40%)

Central Statistical Organization on (CSO) National Sample Survey (NSS), National Council of Applied Economics and Research, Department of Commercial Intelligence and Statistics (D.C.I.S), Indian Statistical Institution (I.S.I), Principal Publications containing data on the topics such as population, agriculture and industry.

National Income:

(30%)

Concept of National Income, Uses, methods of it's estimation, Lorenz curve and Pareto's law of Income distributions - Concepts, derivations and Applications.

BOOKS:

1. Pathak, K.B. and Ram, R.(1992) : Techniques of Demographic Analysis Himalaya Pub. House, Delhi.
2. Jaiswal, M.C. (1984) : Arth Vishayak ankadashashtra (in Gujarati); University Granth Nirmal Board, Ahmedabad.
3. Srivastava, O.S. (1983) : A Textbook of Demography; Vikas Publishing House.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-I.
Semester - II
Paper No : 206

ADVANCED STATISTICS - 6

(Syllabus effective from Academic Year 2010-11 onwards)

(1) Econometrics Methods : (50 %)

The nature and role of econometrics. Introduction to econometrics models :

(i) Single equation model (ii) Simultaneous equation model.

Single equation model : Ordinary least squares model. Estimation of parameters, Problem of multicollinearity. Generalized least squares model - Estimation of parameters. (Aitken's Estimator), Problem of heteroscedasticity and auto-correction, method of estimation in each case, Grouping of observations and Durbin - Watson test.

Simultaneous equation model: Problem of identification, statements and application of Rank and Order conditions. Estimation of parameters of two equations by two-stage least squares method.

Dynamic Econometrics Model : Autoregressive and distributed lag models, Koyck's approach, Partial adjustment and adaptive expectation model.

(2) Time Series Analysis : (50 %)

Concept of Time series analysis: Concept of stationary time series. Difference between cyclical and oscillatory time series. 1st order Auto regressive model and determination dispersion matrix. Second order Auto regressive series. Auto-correlation function and correlogram. Periodogram analysis. Relation between the periodogram and the correlogram. Serial correlation and serial co-efficient of correlation.

BOOKS :

1. Box and Jenkins.: (1970) Time series analysis, Holden-Day publications.
2. M.C.Jaiswal (1964) : Artha vishayak Ankasashashtra (in Gujarati), University Granth Nirmal Board, A'bad.
3. Gujarati D.(1970) : Basic Econometrics, Mac-Graw Hills.
4. Johnson J.(1982).: Econometrics method, Mac-Graw hills and Kkogakusha Ltd.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-II

Semester - III

Paper No : 304

ADVANCED STATISTICS PAPER : 7

(Syllabus effective from Academic Year 2011-12 onwards)

(1) Design of Experiment -1:

Linear model, Analysis of Variance, Basic Principles of design of Experiment.
Analysis of CRD and their application. (25%)

Analysis of RBD and their application. Missing plot technique for only one yield missing. Efficiency of RBD over CRD. (25%)

(2) Sample Survey - 1 :

Sample surveys, Principal steps involved in sample survey, Specific sampling design : Simple Random Sampling, Determination of sample size under S.R.S. with illustrations. (25%)

Specific Sampling Design : Sampling for proportions and percentages, Determination of sample size under sampling for proportion with illustrations. (25%)

BOOKS :

1. Federer, W.T. (1955): Experimental Designs - Theory and Applications, Oxford & TBH Pub.
2. Shah, S.M. (1976): Nidarshan Padhdhatio and Prayogik Abhikalpanao (In Gujarati); University Granth Nirmal Board, Ahmedabad.
3. Montgomery, D.C. (1991): Design and Analysis of Experiments; John Wiley.
4. Cochran, W.G. (1984): Sampling Techniques, Wiley Eastern.
5. Mukhopadhyay, P. (1979): Applied Statistics, Books & Allied Pub., Kolkata.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-II.

Semester - III

Paper No : 305

ADVANCED STATISTICS PAPER : 8

(Syllabus effective from Academic Year 2011-12 onwards)

1. Game Theory : Competitive games, Two person zero sum game, Minimax and Maximin principle, Fundamental theorem of game theory, Saddle point and the value of the game (based on pure strategies), Mixed strategies. Solution of the game with/without saddle point. Dominance rule, Solution of $m \times 2$ and $2 \times n$ games using graphical method. Algebraic method of solving games. Solution of game by linear programming approach. Solution of game by iterative method. Theory related to 2 - person, non - zero sum games. Limitations of game theory. Significance of game theory. (40 %)

2. PERT / CPM : Introduction, Historical development of PERT/CPM. Techniques, application of PERT/CPM techniques, Basic steps. Network diagram representation, rules of drawing network diagram, time estimates and critical path in network analysis, PERT technique, updating resources allocation, limitations of network techniques, project monitoring. (40 %)

3. SIMULATION : Introduction, Simulation Defined, Reasons for using simulation, Methodology for simulation, Advantages and Drawbacks of simulation, Managements Application. (20 %)

BOOKS :

1. Kanti Swarup, P.K.Gupta and Man Mohan (1995) Operations Research: Sultan Chand & Sons; New Delhi.
2. Sharma S.D.(2005-06) :Operations Research: Kedar Nath & sons, Meerut.
3. V.K.Kapoor (2003): Operations Research Techniques for management sultan Chand & sons, New Delhi.
4. Sharma, J.K. (1998): Operations Research; Mac Milan Pub., New Delhi.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-II.

Semester - III

Paper No: 306

ADVANCED STATISTICS PAPER : 9

(Syllabus effective from Academic Year 2011-12 onwards)

(1) LINEAR PROGRAMMING AND ITS APPLICATIONS :-

Meaning, assumptions, uses and limitations of linear programming. Mathematical formulation of linear programming problem (L.P.P). Simplex method, Big-M method, Two phase method and its applications. Degeneracy problem. (50%)

(2) Inventory Models : EOQ models with uniform rate of demand and shortages not allowed, deterministic models with shortages, instantaneous production, finite rate of replacement model, probabilistic demand models, single period models with uniform demand, ABC analysis of inventory. (50%)

BOOKS :

1. Kanti Swarup, P.K.Gupta and Man Mohan (1995) Operations Research: Sultan Chand & Sons; New Delhi.
2. Sharma S.D.(2005-06) :Operations Research: Kedar Nath & sons, Meerut.
3. V.K.Kapoor (2003): Operations Research Techniques for management sultan Chand & sons, New Delhi.
4. Sharma, J.K. (1998): Operations Research; Mac Milan Pub., New Delhi.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-II.

Semester - IV

Paper No : 404

ADVANCED STATISTICS PAPER : 10

(Syllabus effective from Academic Year 2011-12 onwards)

(1) Design of Experiment -2:

The analysis of LSD and their application, missing plot technique only for one yield missing. Efficiency of LSD over CRD and RBD. (25%)

2^2 and 2^3 factorial design with analysis and application. Concept of total and partial confounding with illustration. (25%)

(2) Sample Survey - 2 :

Specific Sampling Design : Stratified Random sampling. Determination of sample size under stratified random sampling. Two stage sampling. with illustration. (25%)

Specific Sampling Design : Systematic Sampling . Two phase sampling and its uses in ratio and regression estimation, Use of auxiliary information at estimation stage. (25%)

BOOKS :

1. Federer, W.T. (1955): Experimental Designs - Theory and Applications, Oxford & TBH Pub.
2. Shah, S.M. (1976): Nidarshan Padhdhatio and Prayogik Abhikalpanao (In Gujarati); University Granth Nirmal Board, Ahmedabad.
3. Montgomery, D.C. (1991): Design and Analysis of Experiments; John Wiley.
4. Cochran, W.G. (1984): Sampling Techniques, Wiley Eastern.
5. Mukhopadhyay, P. (1979): Applied Statistics, Books & Allied Pub., Kolkata.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-II.

Semester - IV

Paper No : 405

ADVANCED STATISTICS PAPER : 11

(Syllabus effective from Academic Year 2011-12 onwards)

1. The Sequencing problems :

Introduction, General Assumptions, Basic Terminology, Processing n-job through two machines, Processing n-jobs through three machines, Processing two jobs through m-machines, Processing n-jobs through m-machines. (20 %)

2. Statistical Quality Control :

Concept of quality and statistical quality control. Benefits of statistical quality control, Sampling inspection, Acceptance sampling plans for attributes, single and double sampling plans for attributes. Sequential sampling plans for attributes, Concept of Total Quality Management (TQM). Introduction to just in time (JIT) inventory, Quality circles production. (40 %)

3. Decision Theory : Introduction, few management applications, No data decision problem [H,A,L], Statistics decision problem [H, D, R], Non randomized decision rules, risk function, better decision rule, admissible decision rule, Structure of Decision - making problem. Types of decision - making Environment, Decision making under certainty, Decision making under risk, decision making under uncertainty.[maximin and minimax decision rules]. Prior information, Posterior probabilities and Bayes decision rule. Decision making using utility theory. (40 %)

BOOKS :

1. Sharma S.D.(2005-06) Operations Research: Kedar Nath & sons, Meerut.
2. V.K.Kapoor (2003): Operations Research Techniques for management sultan Chand & sons, New Delhi.
3. Anand Sharma (2006) : Statistics for management : Himalaya Publishing house, Mumbai.
4. Moshe B Levy H (1984) : Statistical decision applications in Business and Economics : mc graw hills.
5. Grant E.L.(1964) : Statistical quality control : mc graw hills.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.Com-II.

Semester - IV

Paper No : 406

ADVANCED STATISTICS PAPER : 12

(Syllabus effective from Academic Year 2011-12 onwards)

LINEAR PROGRAMMING:-

Duality in linear programming problem, concept and application, advantage of duality. Statement of duality theorem and its applications. Revised simplex method. (50%)

(2) Queuing Theory:

Classification of queues, Poisson process and exponential distⁿ, transient and steady states, Poisson queues with single service channel, Finite and infinite capacity and its characteristics. (50%)

BOOKS:

1. Kanti Swarup, P.K.Gupta and Manmohan(1995): "Operations Research", Sultan Chand & Sons; New Delhi.
2. Sharma S.D.(1998): " Operations Research" ; Kedarnath & Sons, Meerut.
3. Sharma J.K.(1998): " Operations Research" ; Macmilan Publication, New Delhi.
4. Gupta R.K.(2000): " Operations Research" ; Krishna Prakashan Media (P) Ltd, Meerut.
5. Jit S.Chandan, Mahendra P Kawatra, ki ho kim(1994):; essentials of linear programming; Vikas Publication House Pvt Ltd, New Delhi.
6. Kapoor V.K.(1994) " Operations Research" ; Sultan Chand & Sons, New Delhi.