

VEER NARMAD SOUTH GUJARAT UNIVERSITY

University Campus, Udhna-Magdalla Road,
SURAT – 395 007.

M.Com. (Part- I) Statistics

ADVANCED STATISTICS PAPER I

(External Programme)

(1) Statistical Inference: (50%)

(i) Estimation:

Estimator, Different measures of closeness of an Estimator, some properties of estimators: consistency, **sufficiency**, unbiasedness and efficiency. Methods of estimation: Maximum likelihood estimator and it's properties (without proof), Method of maximum likelihood, method of moments, method of chi-squares, Confidence intervals, methods of finding confidence intervals, large sample confidence intervals, confidence intervals for parameters elementary distributions.

(ii) Testing of Hypotheses:

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

(2) Univariate Distribution:

Introduction, Important properties and application of (i) Hyper Geometric distribution (ii) Negative Binomial distribution (iii) Cauchy distribution (iv) Laplace distribution (v) Log-Normal distribution. (25%)

(3) Non-Parametric Tests:

Introduction, comparison of parametric and non-parametric tests, Run test for randomness, Kolmogrov-Smirnov test of goodness of fit, extension of Median test, Kruskal-Wallis test – (one-way analysis of variance), Rank correlation, Kendall's Rank correlation. (25%)

BOOKS :

- (1) Johnsons, N. L. and Kotz, S. (1977) :Distributions in Statistics, John Wiley.
- (2) Ferguson, T. (1967): Mathematical Statistics; Academic Press.
- (3) Jaiswal, M. C. (1973): Statistical 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 Behavioural Sciences; Mac-Graw Hills.

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ADVANCED STATISTICS PAPER II (External Programme)

(1) Demography :

Meaning and scope of demography, history and growth of demography, measures of population growth, common measures of growth rate, growth curves: Logarithmic, Exponential, Gompertz and Logistic curves , measures of mortality rates, natal and porinatal mortality rates, stadardised age, specific death rates with numerical examples, Life -Tables, Abridged life – tables, numerical examples to illustrate these methods, population projections: methods of projection, study of sample models for population projections, Fertility and Reproduction rates. (40%)

(2) Indian Official Statistics :

Present official statistical system in India, Central Statistical Organization, National Sample Surveys, National Council of Applied Economics Research, Computer Center of Department of Statistics in India - functions, objectives methods of collection of official statistics, it's reliability and limitations. Principal publications containing data on the topics such as population, agriculture, industry. Index Number: meaning, need, uses, selection of items, collection of price data, fixing of weights, selection of base, computational methods with precautions in it's uses. (30%)

(3) National Income :

Concept of National Income. Methods of it's estimation. Lorenz curve and Pareto's law of Income Distribution: concept, derivations and applications. (30%)

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 Nirman Board, Ahmedabad.
- (3) Srivastava, O. S. (1983): A Textbook of Demography; Vikas Publishing House.

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ADVANCED STATISTICS PAPER III (External Programme)

(1) Mathematical Economics:

Concept of utility function and indifference curves, demand and 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, Leontief's input-output static, open and closed models and its importance in inter- industry relations. (40%)

(2) Econometric methods:

The nature and role of econometrics, Introduction to econometric models:
(i) Single equation model, (ii) Simultaneous equations 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 autocorrelation, methods of estimation in each case, grouping of observations and Durbin-Watson test.
Simultaneous equations models: Problem of identification : Statement and application of Rank and order conditions. Estimation of parameters of two equations by two-stage least squares method. (30%)

(3) Time Series Analysis:

Stationary time-series, 1st order Auto-regressive model & determination of dispersion matrix, Autocorrelation function, correlogram and periodogram analysis. (30%)

BOOKS :

- (1) Allen, R. G. D. : (1973): Mathematical Analysis for economists.
- (2) Box and Jenkins (1970): Time Series Analysis; Holden – Day Publications.
- (3) Jaiswal, M. C. (1964): Artha Vishayak Ankadashashtra (in Gujarati); University Granth Nirman Board , Ahmedabad.
- (4) Handerson, M. A. & Quandt (1980): Micro Economics Theory / Mathematical Economics, Mac-Graw Hills.
- (5) Gujarati, D. (1979): Basic Econometrics; Mac-Graw Hills.
- (6) Johnston, J. (1982): Econometric methods; Mac-Graw Hills and Kogakusha Ltd.