**VEER NARMAD SOUTH GUJARAT UNIVERSITY**  
University Campus, Udhana-Magdalla Road,  
Surat - 395 007.  

**M.Sc.: STATISTICS**  
**Effective From: 2007 – 2008**  

**M. Sc.-II**

<table>
<thead>
<tr>
<th>Paper No</th>
<th>Title of the paper</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>VI</td>
<td>Testing of Hypotheses &amp; Decision Theory</td>
<td>Int. 30</td>
</tr>
<tr>
<td>VII</td>
<td>Linear Models &amp; Design of Experiments</td>
<td>Int. 30</td>
</tr>
<tr>
<td>VIII</td>
<td>Mathematical Economics &amp; Econometrics</td>
<td>Int. 30</td>
</tr>
<tr>
<td>IX</td>
<td>Operations Research</td>
<td>Int. 30</td>
</tr>
<tr>
<td>X</td>
<td>Introduction to Statistical Software</td>
<td>Int. 30</td>
</tr>
<tr>
<td>Practical paper-III</td>
<td>Practical Paper- III based on theory papers using statistical software</td>
<td>Int. 30</td>
</tr>
<tr>
<td>Practical paper-IV</td>
<td>Practical Paper- IV based on theory papers using statistical software</td>
<td>Int. 30</td>
</tr>
<tr>
<td>Project</td>
<td>At Some industry / firm /organization Report</td>
<td>Int. 100</td>
</tr>
<tr>
<td>Viva – Voce</td>
<td></td>
<td>Int. 30</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>Int. 390</td>
</tr>
</tbody>
</table>
PAPER VI
TESTING OF HYPOTHESES & DECISION THEORY

Section-B: TESTING OF HYPOTHESES

Stating the problem of testing of hypotheses as a special case of general decision problem. Simple and composite hypotheses, Critical function and critical region, randomized test, non-randomized test, size of the test, Power function of a test. Generalized Neyman–Pearson’s Lemma, Most Powerful test and Uniformly most Powerful test. UMP tests for families of distributions admitting monotone likelihood ratio, two sided hypotheses, use of least favourable distribution.


REFERENCES

Section II: DECISION THEORY


Natural ordering of decision rules. Complete and essentially complete classes of decision rules. Admissibility of Bayes rules. Existence of Bayes decision rules and of minimax complete class when parameter space is finite and the risk set is closed and bounded from below.

Invariant decision problems, Invariant decision rules. Admissible minim as invariant rules.

Introduction to non-parametric test.
REFERENCES

Section I: LINEAR MODEL

The general linear model: Gauss-Mark off set up, estimation of its parameters, least squares, and generalized least squares, Normal equations and least squares estimates. Estimation of linear parametric function, variance and co variances of least squares estimates, estimation of error variance, estimation with correlated observations, least square, estimates with restrictions on parameters, simultaneous estimates of linear parametric functions, Canonical form of the linear hypothesis model and Error and Estimation spaces.

Estimation of scale parameter in the general linear model by quadratic functions. Tests of hypotheses regarding parameters of a general linear model, tests involving linear functions of parameters, tests of sub hypotheses.

REFERENCES


Section II: DESIGN OF EXPERIMENT

General theory of analysis of experimental designs with one way elimination of heterogeneity (intrablock analysis only).

General properties of incomplete block design; Balanced incomplete block design and related designs, resolvable and affine resolvable BIB designs, partially balanced incomplete block designs with two associated classes.

General theory of analysis of experimental designs with two way elimination of heterogen (intrablock analysis only); youden square and Crossover design.

Missing plot technique. General theory of symmetric factorial experiments; concepts of total and partial confounding and 2n and 3n confounded experiments.

Construction of (i) orthogonal Latin squares, (ii) Balanced incomplete block designs using finite geometries and (iii) total and partially confounded symmetric factorial experiments.
REFERENCES

2. Dey Alok: “Theory of Block Designs”.
Section I : MATHEMATICAL ECONOMICS

1. Input – Output Analysis :
2. Growth Models:
3. Time Series Analysis:

REFERENCES


Section II : ECONOMETRICS

The nature and role of econometrics, Introduction to econometric models.

Single Equation method:
Multicolinearity:
Generalized least square method, Heteroscedastic disturbances, grouping of observations.
Autocorrelation:
Simultaneous Equation method:
Estimation methods:
REFERENCES

M.Sc.: STATISTICS

Effective From: 2007 – 2008

M. Sc.-II

PAPER IX

Section I: OPERATIONS RESEARCH
1. Linear Programming:
2. Duality:
3. Transportation and Assignment Problems:
4. Inventory Management Systems:
5. Game Theory:

Section II: OPERATIONS RESEARCH
1. Sensitivity Analysis:
2. Integer Programming:
3. Replacement Theory:
4. PERT / CPM:
5. Sequencing:
6. Goal Programming:

REFERENCES

**INTRODUCTION TO STATISTICAL SOFTWARES**

Introduction and use of Mat lab, SYSSTAT, SPSS and other such statistical packages for analysis of practical problems.

**Mat lab**
- Introduction:
- Plotting:
- Branching statement and program design:
- Loops:
- User defined function:

**SPSS**
- Introduction to SPSS
- Preparing data for SPSS:
- Procedure Statistics for Data Analysis:

**REFERENCES**