

Code -23

**Solapur University, Solapur.**  
**Semester Pattern Syllabus**  
**M. Com. Part-I (Semester – I)**  
**ADVANCED STATISTICS**  
**Paper I**  
**(Statistical Models For Business Decisions –I )**  
**(w. e. f. June 2014)**

**Periods**

**Unit-1: Matrix Algebra :-** **(15)**

Definition of a matrix, types of matrices, addition, subtraction, multiplication of matrices, inverse of matrix. Rank of Matrix, Determinant. Finding value of determinant. Solving the linear homogeneous and non-homogeneous system of equations by matrix method. Cramer's rule (for not more than three variables)

**Unit-2: Introduction to Operations Research (O.R.):** **(15)**

Origin, development definitions and applications of O.R. phases of O.R. Mathematical formulation of L.P.P., Solution by Graphical Method.

**Unit-3: Linear Programming Problems :** **(15)**

Definitions of slack surplus variables. L.P.P. in general form, canonical form and Standard form, definitions of solution, feasible solution, basic feasible solution, optimal solution, degenerate and non-degenerate solution. Simplex Algorithm and example of '<' type of constraints.

**Unit-4: Assignment Problem :** **(15)**

Definition of A .P. Mathematical formulation of A.P., Reduction Theorem, Assignment algorithm, Unbalanced Assignment Problems, examples on it.

**Reference Books :**

- 1 Shantinayaran : Text Book of Matrices
- 2 S.D. Sharma : Text Book of Linear Programming Problem
- 3 S.D.Sharma : Operations Research
- 4 R.K. Gupta : Text Book of Linear Programming
- 5 Kantiswarup, Gupta Man-Mohan : Operations Research
- 6 Goel And Mithal : Operations Research

# Solapur University, Solapur

**Semester Pattern Syllabus**  
**M. Com. Part-I (Semester – I)**  
**Paper - II**  
**ADVANCED STATISTICS**  
**Design of Experiments**  
**(w. e. f. June 2014)**

**Unit-1: Introduction to the basic terms of designs of Experiments : (15)**

Experimental Units, Treatments, Randomization, Replications,  
Local Control, choice of size and shape of plot for uniformity trials.

**Analysis of variance :**

Analysis of variance for one - way classification : Mathematical model, assumptions basic hypothesis and ANOVA table. Analysis of variance for two -way classification : mathematical model, assumptions basic hypothesis, ANOVA table.

**Unit-2: Completely Randomized Design (CRD) : (15)**

Description, layout, mathematical model, hypothesis, and its analysis of variance, test for equality of treatment effects, ANOVA table.

**Unit-3: Randomized Block Design (RBD) : (15)**

Description, layout, mathematical model, hypothesis, and its analysis of Variance, test for equality of treatment effects, ANOVA table.

**Unit-4: Latin square Design (LSD) : (15)**

Description, layout, Mathematical model ,hypothesis, and its analysis of variance, ANOVA table.

**Reference Books:**

- 1 Gupta and Kapoor : Applied Statistics
- 2 Goon, Gupta & Dasgupta : Fundamentals of Statistics (Vol. I & II)
- 3 Cochran & Cox : Experimental designs
- 4 Feherer : Experimental Designs



**Solapur University, Solapur**  
**Nature of Question Paper For Semester Pattern**  
**• Faculty of Commerce (B.Com., M.Com.)**

**Model Question Paper**  
**(w.e.f. June 2010)**

**Time: - 2 hrs.**

**Total Marks-50**

- |             |  |           |
|-------------|--|-----------|
| <b>Q. 1</b> | <b>Multiple choice questions</b><br><b>(four alternatives should be given)</b> | <b>10</b> |
|             | 1 -----  |           |
|             | (a)            (b)            (c)            (d)                               |           |
|             | 2  |           |
|             | 3  |           |
|             | 4  |           |
|             | 5  |           |
|             | 6  |           |
|             | 7  |           |
|             | 8  |           |
|             | 9  |           |
|             | 10   |           |
| <b>Q. 2</b> | <b>Answer the following</b><br><b>(Short note/Short problem/Short answer)</b>  |           |
|             | (A)  | <b>05</b> |
|             | (B)  | <b>05</b> |
| <b>Q. 3</b> | <b>Answer the following</b><br><b>(Short note/Short answer/Short problem)</b>  |           |
|             | (A)  | <b>05</b> |
|             | (B)  | <b>05</b> |
| <b>Q. 4</b> | <b>Answer any one (Long answer/Problem)</b>                                    | <b>10</b> |
|             | i)   |           |
|             | ii)  |           |
| <b>Q. 5</b> | <b>Answer any one (Long answer/Problem)</b>                                    | <b>10</b> |
|             | i)   |           |
|             | ii)  |           |