

**MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR**  
**THIRD YEAR B. Sc. STATISTICS 2016-17**

**PAPER - II**  
**DESIGN OF EXPERIMENTS AND STATISTICAL QUALITY CONTROL**

**TIME: 3 hours**

**Max. Marks 50**

**UNIT-1**

Analysis of variance for one-way and two-way classification (with one observation per cell). Linear model and its different types, Transformations, Basic concepts in design of experiments, Criteria for a good design, Uniformity trials, Size and Shape of block and plots.

**UNIT-II**

Completely randomized and Randomized block designs.  
Efficiency of Randomized block design over Completely randomized design.

**UNIT-III**

Latin square design.  
Missing plot technique, Estimation of single missing value in Randomized block and Latin square designs.

**UNIT-IV**

Statistical Quality Control: Process control and Product control, Control charts, 3 $\sigma$ -control limits, Tools for SQC, Control charts for variables and attributes,  $\bar{X}$  and R charts,  $\bar{X}$  and S charts, p, np and c-charts. Criterion for detecting lack of control in various charts. Natural tolerance and specification limits, Modified control limits.

**UNIT-V**

Principles of Acceptance Sampling Problem of lot acceptance, good and bad lots, producer's & Consumer's risk, single & double sampling plans and their O.C. functions. Concepts of AQL, LTPD, AOQL, Average amount of Inspection and ASN functions.

**Recommended Books :**

1. Gupta S.C. and Kapoor V.K. : Fundamentals of Applied Statistics, Sultan Chand & Sons, New Delhi.
2. Goon, A.M., Gupta, M.K. and Dasgupta, B. : Fundamentals of Statistics, Vol.I. The World Press Pvt. Ltd. Calcutta
3. Cochran, W.G. and Cox, G.M : Experimental Designs, John Wiley & Sons, New York.

**Reference Books :**

1. Goulden, C.H. : Methods of Statistical Analysis (Hindi Ed.) Bihar Hindi Granth Academy, Patna
2. Snedecor, G.W. : Statistical Methods (Hindi Ed.) Commission of Scientific & Technical Words, Ministry of Education, Govt. of India
3. Mukhopadhyay, : Applied Statistics, New Central Book Agency Pvt., Ltd. Calcutta P. (1999)
4. Montgomery, D.C'.(1991) : Design and Analysis of Experiments, Wiley Eastern.
5. Duncan A.J. (1914) : Quality Control and Industrial Statistics. Fourth editions, Taraporewala & Sons.
6. Montgomery, C. (1991) : Introduction to the Statistical Quality Control (Second edition.) John Wiley & Sons.