

PART D



Analysis of Variance and Design of Experiments

ANALYSIS OF VARIANCE AND DESIGN OF EXPERIMENTS

In Part C, you have learnt about parametric tests such as Z, t and chi-square tests for one sample problems as well as Z, t and F-tests for two-sample problems. But if we are interested in testing the means of more than two independent populations/groups, then we cannot apply the t-test. This is because if we use the t-test many times, type I error increases while testing the hypothesis. In such situations, we use analysis of variance (ANOVA).

The fourth part of this lab course comprises Sessions 11 and 12, which enable you to apply analysis of variance technique with the help of MS Excel 2007.

In Block 2 of MST-005 (Statistical Techniques), you have learnt that we use analysis of variance (ANOVA) for testing the means of more than two independent populations/groups. The analysis of variance is a method of splitting the total variation in data into different components that measure different sources of variations. In **Session 11**, you will learn how to apply one-way, two-way ANOVA (with one observation per cell and m observations per cell) using MS Excel 2007.

In Block 3 of MST-005, you have learnt that in any field of study such as agriculture, life sciences, industry, etc., it is essential to plan an experiment, that is, decide the objective of the experiment and the type of data required. In order to make efficient use of time and energy, experiments should be planned and designed carefully. Once the design of an experiment is finalised, observations are made and data so obtained are analysed with the help of analysis of variance (ANOVA).

Session 12 deals with the analysis of experimental data using completely randomised design (CRD), randomised block design (RBD) and Latin square design (LSD) in MS Excel 2007.

All exercises of this part have been designed in such a way that after successfully completing them, you will be acquainted with the analysis of variance and how to apply ANOVA to analyse experimental data using MS Excel 2007.

You should study Blocks 2 and 3 of MST-005 entitled Statistical Techniques thoroughly before performing the activities in the lab sessions of Part D. All concepts and formulae used there will be applied here.