Indira Gandhi
National Open University
School of Sciences

MST-004
STATISTICAL INFERENCE

Block

3

TESTING OF HYPOTHESIS

Curriculum and Course Design Committee

Block Preparation Team

Dr. Ramkishan **(Editor)**
Department of Statistics
D. A. V. (PG) College
C.C. S. University, Merrut

Dr. Parmod Kumar **(Language Editor)**
School of Humanities, IGNOU

Course Coordinator: Mr. Prabhat Kumar Sangal
Programme Coordinator: Dr. Manish Trivedi

Dr. Diwakar Shukla **(Units 1 - 4)**
Department of Mathematics and Statistics
Dr. Hari Singh Gaur University, Sagar

Mr. Prabhat Kumar Sangal **(Units 1 - 4)**
School of Sciences, IGNOU

Block Production

Mr. Sunil Kumar, AR (P),School of Sciences, IGNOU
CRC prepared by Mr. Prabhat Kumar Sangal, School of Sciences, IGNOU

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TESTING OF HYPOTHESIS

In previous block of this course, we have discussed one part of statistical inference, that is, estimation and we have learnt how we estimate the unknown population parameter(s) by using **point estimation** and **interval estimation**. In this block we will focus on the second part of statistical inference which is known as **testing of hypothesis**.

In this block, you will study the basic concept of testing of hypothesis and different kinds of well-known tests. At the end of this block you will be aware of the idea, procedure and applications of the hypothesis testing. This block contains four units.

Unit 9: Concepts of Testing of Hypothesis

This unit explains the fundamental aspect relating to testing of hypothesis with examples. It describes basic concepts and methodologies as hypothesis, critical region, types of errors, level of significance, general procedure of testing a hypothesis, concept of p-value, relation between confidence interval and testing of hypothesis.

Unit 10: Large Sample Tests

This unit explores the procedure of testing the hypothesis based on one sample and two samples when sample size is large and taken from normal or non-normal population(s). In this unit, you will learn about Z-test for testing of hypothesis about mean, difference of two means, proportion, difference of two proportions, variance and equality of two variances.

Unit 11: Small Sample Tests

This unit is devoted to test a hypothesis based on one sample and two samples when sample sizes are small. In this unit, you will learn about t-test for testing of hypothesis about mean and difference of two means. This unit also explores the idea for testing the hypothesis for equality of two means when samples are dependent and testing of hypothesis about population correlation coefficient.

Unit 12: Chi-square and F Tests

The last unit of this block describes the chi-square test for population variance and F-test for equality of two population variances.

Notations and Symbols

$X_1, X_2, \ldots, X_n$	:	Random sample of size n
H_0	:	Null hypothesis
H_1 or H_A	:	Alternative hypothesis
ω	:	Critical (rejection) region
$\bar{\omega}$	:	Non-rejection region
α	:	Size of critical region or type-I error or level of significance
β	:	Type-II error
$1-\beta$	:	Power of the test
z_α	:	Critical value of Z-test at α level of significance
$t_{(\nu),\alpha}$	:	Critical value of t-test with ν degrees of freedom at α level of significance
$\chi^2_{(\nu),\alpha}$	:	Critical value of χ^2-test with ν degrees of freedom at α level of significance
$F_{(\nu_1,\nu_2),\alpha}$	:	Critical value of F-test with (ν_1, ν_2) degrees of freedom at α level of significance