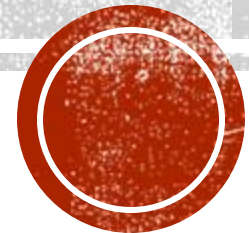


# ***HYPOTHESIS TESTING***

## **Chapter Outline:**

- **Concept**
- **Type – I & Type – II Error**
- **Mean Test**



**Semester : IV**

**Course Code: CCo9**

# CONCEPT:

## Objective of Hypothesis Testing:

- The objective of hypothesis testing is to choose between two competing hypotheses about the value of a population parameter. For instance, one hypothesis might claim that the average wages of men and women are equal, while the alternative claim that men earn more than women.
- The hypothesis which actually to be tested is usually given the notation  $H_0$  and this is referred to as the *Null Hypothesis*. On the other hand the hypothesis which is assumed to be true when the null hypothesis is false, is referred to as the alternative hypothesis and it is symbolized by  $H_A$  or  $H_1$ .
- *Both the null and alternative hypothesis should be stated before any statistical test of significance is conducted.*

Let us assume we are claiming that average wages for 5000 workers is Rs. 1000. Therefore to measure the statistical significance of this statement the Null and Alternative Hypothesis will be as follows:

- $H_0 : \mu = 1000$  (Where  $\mu$  represents population mean wage)
- $H_1 : \mu > 1000$



# 1 AND 2 TAILED TEST:

## □ 1 Tailed Test:

When the alternative hypothesis specifies that the population parameter lies entirely above or below the value specified in  $H_0$  is called *1- Tailed* or *One-sided Test*. E.g.

- $H_0 : \mu = 1000$
- $H_1 : \mu > 1000$

## □ 2 Tailed Test:

An alternative hypothesis that specified that the parameter can lie on either side of the value specified by  $H_0$  is called a two-tailed or two sided test. E.g.

- $H_0 : \mu = 1000$
- $H_1 : \mu \neq 1000$

**Use of a 1-tailed or 2-tailed test depends on the nature of the problem**



# CONCEPT OF TYPE – I & TYPE – II ERROR

We reject  $H_0$  only when the chance is small that  $H_0$  is true. Our decisions are based on probability rather than certainty. Therefore there are chances of making errors.

- **Type – I Error:** We reject the null hypothesis when the null is true. The probability of Type I error is denoted by  $\alpha$ .

*Therefore  $\alpha = \text{Probability of Type I error} = P(\text{Rejecting } H_0 \mid H_0 \text{ is true})$*

- **Type – II Error:** we accept the null hypothesis when it is false. The probability of Type II error is denoted by  $\beta$ .

*Therefore  $\beta = \text{Probability of Type II error} = P(\text{Accepting } H_0 \mid H_0 \text{ is false})$*

Typical values chosen for  $\alpha$  are .05 or .01. So, for example, if  $\alpha = .05$ , there is a 5% chance that, when the null hypothesis is true, we will erroneously reject it



# TYPE – I & TYPE – II ERROR – CONTD.....

<b>Action</b>	<b>True Situation</b>	
	<i>Ho is true</i>	<i>Ho is false</i>
Reject Ho (Accept H1)	Type – I Error	Correct Decision
Reject H1 (Accept Ho)	Correct Decision	Type – II Error



**THANK YOU.....**

