TESTING OF HYPOTHESIS

BASIC DEFINITIONS :

Population :–

A population is used to refer any collection of individual it may be finite or infinite.

Sample :–

A sample is a small portion selected (or drawn) from the population and the process of drawing a sample from a population is called sampling.

Sample size :–

The no. of individual in a selected sample is called the sample size.

parameter and statistics :–

Any statistical method computed from population data is known as parameter and Any statistical method computed from sample data is known as statistics.

NOTATIONS :–

MEASURE		POPULATION		SAMPLE
Size	→	N	→	n
Mean	→	μ	→	$\bar{x}$
Standard deviation	→	σ	→	s
proportion	→	p	→	p'
Variance	→	σ^2	→	s^2

Sampling Distribution :–

The various value of statistics so obtained may be arrange as a frequency distribution which is known as sampling distributions.

Standard Error :–

The standard deviation of sampling distribution of a statistic is known as its standard error, abbreviated as S.E. (i.e. avg. amount of variability from the observation of a sampling distribution).

Statistical Hypothesis :–

In attempting to reach decision about population on the basis of sample observations, we make assumptions about population, which are not necessarily true, are called statistical hypothesis.

Null Hypothesis :–

Null hypothesis is the hypothesis which is tested for possible rejection under the assumption that it is true and is denoted by H_0.
[(ie) hypothesis of no difference].

Alternative Hypothesis :–

A hypothesis that is complementary to null hypothesis is called alternative hypothesis and is denoted by H_1.

A procedure for ~~designing~~ deciding whether to accept or reject the null hypothesis is called the test of hypothesis.

Level of Significance :–

It is the probability level below which the null hypothesis is rejected. Generally 5% and 1% level of significance are used.

Critical region (or) Region of rejection :—

The critical region of a test of statistical hypothesis is that region of the normal curve which leads to the rejection of null hypothesis, H_0. Those corresponds region which lead to the acceptance of H_0 is called acceptance region.

Error in Sampling :—

Errors are Type I, Type II errors.

Type I error : Reject H_0 when it is true.

Type II error : Accept H_0 when it is false.

P (Type I error) $= \alpha$ & P (Type II error) $= \beta$.

One tail & two tail test :—

If μ_0 is population parameter & μ is the sample statistics, then the null hypothesis is given by $H_0 : \mu = \mu_0$

Alternative hypothesis is given by,

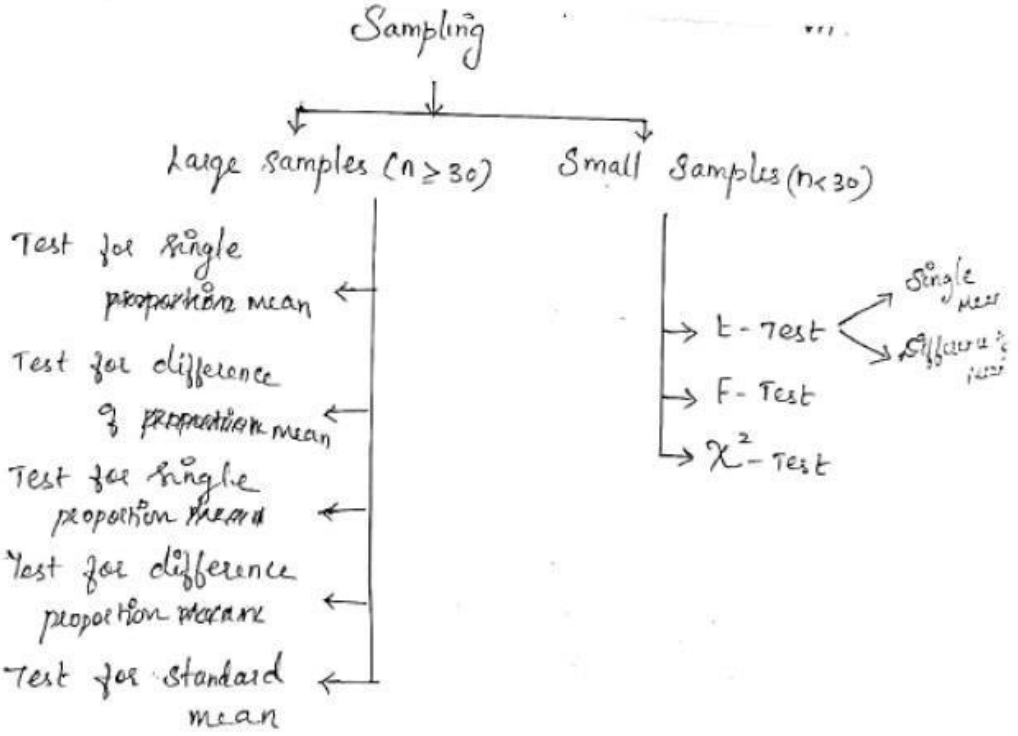
$H_1 : \mu \neq \mu_0$ (two-tailed)

$H_1 : \mu > \mu_0$ (Right tailed) (one tail)

$H_1 : \mu < \mu_0$ (Left tailed) (")

PROCEDURE FOR TESTING A HYPOTHESIS :-

1) Formulate H_0 and H_1
2) Choose the level of significance α
3) compute the test statistic, using the data available.
4) pick out the critical value from the tabulation
5) Conclusion: compare the computed value of the test statistic with the critical value at the given level of significance.



Large samples ($n \geq 30$)

Critical values (or) significant values:-

The sample values of the statistic beyond which the null hypothesis will be rejected are called critical values or significant values.

Natures of test	Level of significance 1 %	5 %	10 %
Two tailed test(z_α):	2.58	1.96	1.645
one tailed test(z_α):	2.33	1.645	1.28 (right)
	-2.33	-1.645	-1.28 (left)