

## UNIT - IV

### Testing of Hypothesis

1. What is Sampling distribution?

The probability distribution of the Sampling Statistic is called Sampling distribution.

2. What are the parameters and Statistics in Sampling?

Statistical measurements of Population are called Parameters.

Eg. Population mean  $\mu$

Population S.D.  $\sigma$

Statistical measurements of Sample are called Statistics.

Eg. Sample mean  $\bar{x}$

Sample S.D.  $s$

3. Mention various steps involved in testing of Hypothesis:

1. Set Null Hypothesis  $H_0$

2. Set Alternate Hypothesis  $H_1$

3. Compute Test Statistic

$$Z = \frac{t - E(t)}{S.E(t)}$$

4. Select appropriate level of significance  $\alpha$

5. Calculate critical value  $Z_\alpha$  from the Statistical table.

6. If  $|Z| < Z_\alpha$ , Accept  $H_0$ . If  $|Z| > Z_\alpha$ , reject  $H_0$ .

7. Write conclusion.



4. What 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.

5. Give two applications of  $\chi^2$ -test? (or) Main uses.

1. Test the Goodness of fit.
2. Test the independence of Attributes.
3. Test Population Variance.

6. Define  $\chi^2$ -test of goodness of fit.

$$\chi^2\text{-Test statistic} = \sum \frac{(O - E)^2}{E} \text{ where}$$

$O$  is observed frequency &  $E$  is the expected frequency.

7. What are the assumptions made in t-test?

1. Parent population is normal.
2. Sample size  $n < 30$ .
3. Population S.D. is not known.
4. Samples are independent.

8. Write the condition of  $\chi^2$ -test?

(or)

Write the assumption of  $\chi^2$ -test?

1. Samples are independent.
2.  $\sum O_i = \sum E_i$ .



3. Theoretical Frequency Should be 5 or greater than 5.

4. Grand Total  $N$  is atleast 50.

7. What do you mean by one tailed or two-tailed test?

If  $H_1: \mu < \mu_0$  or  $\mu > \mu_0$ , then the test is one tailed.

If  $H_1: \mu \neq \mu_0$ , then the test is two tailed.

10. What are the application of  $t$ -test?

(or)

State the uses of Student  $t$ -distribution.

1. To test the significance difference between sample mean & population mean.

2. To test significance difference between sample mean.

11. Write  $\chi^2$  formula for  $2 \times 2$  contingency table?

Ans:

For the  $2 \times 2$ , contingency table

a	b
c	d

$$\chi^2 = \frac{(ad-bc)^2 (a+b+c+d)}{(a+b)(c+d)(a+c)(b+d)}$$

12. What is meant by small & large sample?

Small sample  $n < 30$ , Large sample  $n > 30$ .