

APPENDIX ITEST OF SIGNIFICANCE FOR
THE DIFFERENCE OF MEANS

If the sample size is smaller than 30 (thirty) i.e. $n < 30$, the samples are regarded as small samples, otherwise i.e. for $n > 30$, they are regarded as large samples.

The method of using the test of significance for difference of means for small samples is different from that of large ones. In the case of small samples, t-test of significance is applicable whereas for large samples z-test of significance is applicable.¹⁻²

In the present investigation as the sample size is small (i.e. $n < 30$) t-test has been applied in testing means of u-content in two different groups of samples. The formula used here is

$$\text{Correction factor or C.F.} = \frac{(\sum x)^2}{n}$$

where $(\sum x)^2$ = Sum of the squares of the samples.

n = number of samples.

$$\text{True S.S. or Variance} = \sum (x)^2 - \text{C.F.}$$

$$\text{S.D.} = \sqrt{\frac{\sum (x)^2 - \text{C.F.}}{n - 1}}$$

where, $n - 1$ = number of degrees of freedom.

$$S.E. = \sqrt{\frac{\sum (x)^2 - C.F.}{n(n-1)}}$$

$$\text{Now, S.E.D.} = \left[\sqrt{\frac{\sum (x_1)^2 - (C.F.)_1}{n_1(n_1 - 1)}} + \sqrt{\frac{\sum (x_2)^2 - (C.F.)_2}{n_2(n_2 - 1)}} \right]^{1/2}$$

therefore $t = \frac{d}{\text{S.L.L.}}$ where $d =$ difference between two mean values.

$$= \left[\frac{d}{\sqrt{\frac{\sum (x_1)^2 - (C.F.)_1}{n_1(n_1 - 1)}} + \sqrt{\frac{\sum (x_2)^2 - (C.F.)_2}{n_2(n_2 - 1)}}} \right]^{1/2}$$

REFERENCES

1. Gupta, S.C. and Kapoor, V.K. (ed. 1984). Fundamentals of Mathematical Statistics. Published by Sultan Chand and Sons. 23, Daryaganj, New Delhi - 110 002.
2. Pillai, R.S.N. and Bagavathi, V. (ed. 1984) Statistics, Theory and Practice. S. Chand and Company Ltd. Ram Nagar, New Delhi - 110 055.