Standard Error:

S.E. is measure of chance variation and it is not an error or mistake. or the S.D. of the sampling distribution is called the S.E.
It is calculated by the ratio of S.D of the sample is divided by the square root of the total no. of observation.

$$S.E. = \frac{S.D}{\sqrt{N}}$$

WORK TO DO

where, S.E = Standard Error
S.D = standard deviation
$\sqrt{N}$ = square root of the total no. of observation.

Unpaired data:

Single Mean:-

Q. Size of five fishes in cm 2, 5, 3, 4, 1 respectively. Find out the S.E. of mean.

Solution:

Size of Fish X	$X - \bar{X} = d$ $\therefore \bar{X} = 3$	Deviation d	d^2
2	2 − 3	−1	1
5	5 − 3	+2	4
3	3 − 3	0	0
4	4 − 3	+1	1
1	1 − 3	−2	4

$\Sigma X = 15$
$N = 5$

$\therefore \bar{X} = \frac{15}{5} = 3$

$\Sigma d^2 = 10$

$\therefore S.D. = \sqrt{\frac{\Sigma d^2}{N-1}} = \sqrt{\frac{10}{5-1}}$

$= \sqrt{\frac{10}{4}} = \sqrt{2.5} = 1.5.$

Putting the value of S.D. in the following formulla —

$$S.E = \frac{S.D}{\sqrt{N}} = \frac{1.5}{\sqrt{5}} = \frac{1.5}{2.23}$$

$$= 0.67$$

Double Means or Paired :-

S.E. of difference between two means :-

$$S.E = (\bar{X}_1 - \bar{X}_2)$$

$$= \sqrt{\frac{SD_1^2}{n_1} + \frac{SD_2^2}{n_2}}$$

Q. In a study on growth of children one group of 100 children had a mean hight of 60 cm and S.D. of 2.5 cm while another group of 150 children had a mean hight of 62 cm & S.D. of 3 cm. Find S.E. of difference.

Calculation :-

$$S.E = (\bar{X}_1 - \bar{X}_2)$$

$$= \sqrt{\frac{SD_1^2}{n_1} + \frac{SD_2^2}{n_2}}$$

$$= \sqrt{\frac{(2.5)^2}{100} + \frac{(3)^2}{150}}$$

$$= \sqrt{\frac{6.25}{100} + \frac{9}{150}}$$

APPOINTMENTS

1 WEDNESDAY MARCH

$$= \sqrt{\frac{18.75 + 18}{300}}$$

$$S.E = \sqrt{\frac{36.75}{300}} = \sqrt{0.12}$$

$$= 0.34$$

WORK TO DO

PHONES