3. Measures of variability
(परिवर्तनीयता या विचलन शीलता के मापक)

विचलनशीलता के माप की चार विधियाँ हैं —

1. Range (प्रसार)
2. Quartile Deviation or, Q (चतुर्थक विचलन)
3. Average Deviation or, AD (औसत ")
4. Standard Deviation or, SD (प्रमाणिक ")

## * Standard Deviation or, SD. or, $\sigma$

$$SD = i\sqrt{\frac{\Sigma fx'^2}{N} - c^2}$$

जहाँ, i = class interval
x' = Deviation from AM
c = correction
$c^2 = \left(\frac{\Sigma fx'}{N}\right)^2$

Q→

| Score | f | x' | fx' | $fx'^2$ |
|---|---|---|---|---|
| 65-69 | 1 | 4 | 4 | 16 |
| 60-64 | 3 | 3 | 9 | 27 |
| 55-59 | 6 | 2 | 12 | 24 |
| 50-54 | 8 | 1 | 8·33 | 8 |
| 45-49 | 10 | 0 | 0 | 0 |
| 40-44 | 7 | -1 | -7 | 7 |
| 35-39 | 7 | -2 | -14 | 28 |
| 30-34 | 5 | -3 | -15 | 45 |
| 25-29 | 2 | -4 | -8 | 32 |
| 20-24 | 1 | -5 | -5·49 | 25 |
| | N=50 | | $\Sigma fx' = -16$ | $\Sigma fx^2 = 212$ |

$$SD = i\sqrt{\frac{\Sigma f x'^2}{N} - c^2} \qquad c = \frac{\Sigma f x'}{N} = \frac{-16}{50}$$

$$= (-.32)$$

$$= 5\sqrt{\frac{212}{50} - .1024} \qquad c^2 = (-.32)^2 = .1024$$

$$= 5\sqrt{4.24 - .1024}$$

$$= 5\sqrt{4.1376} \qquad = 5 \times 2.03$$

$$= 10.15 \quad \text{Ans}$$

| | | |
|---|---|---|
| 2 \| 2 | 4.1376 | 2.03 |
| | 4 | |
| 403 \| 3 | 1376 | |
| | 1209 | |
| 406 | 167 | |