

## Chapter 15

### STATISTICS

#### Type-I

Concept: mean deviation for ungrouped data

$$\text{M.D } (\bar{x}) = \frac{\sum |xi - \bar{x}|}{n}, \quad \text{M.D } (M) = \frac{\sum |xi - M|}{n}$$

$\bar{x}$  = arithmetic mean      M=median

- (1) N.C.E.R.T page 351 example 1 (\*)
- (2) N.C.E.R.T page 351 example 2 (\*)
- (3) N.C.E.R.T page 352 example 3 (\*)
- (4) N.C.E.R.T page 360 exercise 15.1 question . 1 (\*)
- (5) N.C.E.R.T page 360 exercise 15.1 question. 3 (\*)
- (6) N.C.E.R.T page 360 exercise 15.1 question. 4 (\*)

#### Type-II

Concept: mean deviation for grouped data discrete distribution

$$\text{M.D } (\bar{x}) = \frac{\sum fi |xi - \bar{x}|}{N}, \quad \text{M.D } (M) = \frac{\sum fi |xi - M|}{N} \quad \text{where } N = \sum fi$$

- (1) N.C.E.R.T page 353 example 4 (\*)
- (2) N.C.E.R.T page 354 example 5 (\*)
- (3) N.C.E.R.T page 360 exercise 15.1 question.5 (\*)
- (4) N.C.E.R.T page 360 exercise 15.1 question.6 (\*)
- (5) N.C.E.R.T page 360 exercise 15.1 question .7(\*)

#### Type – III

Concept: mean deviation for grouped data continuous frequency distribution

$$\text{M.D } (\bar{x}) = \frac{\sum fi |xi - \bar{x}|}{N} \quad \text{where } \bar{x} = A + \frac{h}{N} \sum fi di$$

$$\text{M.D (M)} = \frac{\sum fi |xi - M|}{N} \quad \text{where } M = l + \left( \frac{\frac{N}{2} - C}{f} \right) h$$

- (1) N.C.E.R.T page 359 example 7(\*\*)
- (2) N.C.E.R.T page 361 exercise 15.1 question . 9(\*\*)
- (3) N.C.E.R.T page 361 exercise 15.1 question . 10(\*\*)
- (4) N.C.E.R.T page 361 exercise 15.1 question . 11(\*\*)

#### Type-IV

Concept: variance and standard deviation for ungrouped data

$$\sigma^2 = \frac{\sum (xi - \bar{x})^2}{n}$$

- (1) N.C.E.R.T page 364 example 8(\*)
- (2) N.C.E.R.T page 361 exercise 15.2 question .1(\*)
- (3) N.C.E.R.T page 361 exercise 15.2 question .2(\*)
- (4) N.C.E.R.T page 361 exercise 15.2 question .3(\*)

#### Type-V

Concept: variance and standard deviation of a discrete frequency distribution

$$\sigma^2 = \frac{\sum fi (xi - \bar{x})^2}{N} \quad \text{or } \sigma^2 = \frac{\sum fixi^2}{N} - \left( \frac{\sum fixi}{N} \right)^2$$

- (1) N.C.E.R.T page 365 example 9(\*)
- (2) N.C.E.R.T page 365 example 11(\*)
- (3) N.C.E.R.T page 371 exercise 15.2 question. 4(\*)
- (4) N.C.E.R.T page 371 exercise 15.2 question.5(\*)

#### Type-VI

Concept: variance and standard deviation of a continuous frequency distribution

$$\sigma^2 = \frac{\sum fixi^2}{N} - \left( \frac{\sum fixi}{N} \right)^2 \quad \text{or } \sigma^2 = h^2 \left[ \frac{\sum fidi^2}{N} - \left( \frac{\sum fidi}{N} \right)^2 \right] \quad \text{where } di = \frac{xi - A}{h}$$

- (1) N.C.E.R.T page 370 example 12(\*\*)

- (2) N.C.E.R.T page 372 exercise 15.2 question .8(\*)  
 (3) N.C.E.R.T page 372 exercise 15.2 question .9(\*)  
 (4) N.C.E.R.T page 372 exercise 15.2 question .10(\*)

#### Type-VII

Concept: coefficient of variation  $C.V = \left(\frac{\sigma}{\bar{x}}\right) \times 100$

- (1) N.C.E.R.T page 374 example 14(\*)  
 (2) N.C.E.R.T page 376 exercise 15.3 question .5(\*)

#### Type – VIII(HOT questions)

- (1) N.C.E.R.T page 380 misc exercise questions 2,3,4,5(\*)

### EXTRA AND HOT QUESTIONS

- (1) Find the mean ,variance and standard deviation for the following data

class	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
frequencies	3	4	7	7	15	9	6	6	3

Ans: 56,422.33,20.65

- (2) Find the mean variance and standard deviation using short cut method.

Heights in cm	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115
frequencies	3	4	7	7	15	9	6	6	3

Ans: 93,105.52,10.27

- (3) Calculate mean, variance and standard deviation for the following by short cut method.

classes	30-40	40-50	50-60	60-70	70-80	80-90	90-100
frequency	3	7	12	15	8	3	2

Ans: 62,201, $\sqrt{201}$

- (4) Calculate the mean deviation from the median for the following data.

classes	10-20	20-30	30-40	40-50	50-60	60-70	70-80
frequency	4	6	10	20	10	6	4

Ans: Median=45

Mean deviation=11.33