Chapter 15

STATISTICS

Type-I

Concept: mean deviation for ungrouped data

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

$\bar{x}$ = 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 15.1question. 3 (*)

(6) N.C.E.R.T page 360 exercise 15.1 question. 4 (*)

Type-II

Concept: mean deviation for grouped data discrete distribution

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

(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

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

M.D (M) = $\frac{\sum fi|xi-M|}{N}$ 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 exercise15.2 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

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

(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 = $\left(\dfrac{\sigma}{\bar{x}}\right)$ x 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