Data Handling

* Basic concepts ⇒ { Range, Mean, Mode, Median }

(i) Range → Difference between the highest and lowest observation is called range of data.

| Range = Highest Value - Lowest Value |

Ex!- Find range of 2, 7, 3, 1, 11, 9, 6, 1

Here highest value is = 11
and lowest value is = 1

⇒ Range = 11-1 = 10

(ii) Mean ⇒

$$mean = \frac{Sum\ of\ all\ observations}{number\ of\ observations}$$

Ex!- $mean = \frac{2+7+3+1+11+9+6+1}{8} = \frac{40}{8} = 5$

(iii) Mode ⇒ The observation that occurs most often is know is mode of data.

Ex!- 2, 7, 3, 4, 5, 2, 4, 4, 7, 6, 9 → find mode

∵ Here 4 occurs 3 times
⇒ Mode of above data is 4.

(iv) Median ⇒ for median first we arrange given data in ascending or descending order.

median of data is middle value.

Ex!- 2, 2, 3, 4, 4, 4, 6, 7, 7, 9 { Arrange in ascending order }

∵ median is middle value
⇒ median of above data is 4.

CLASS = VII   Exercise = 3.1

Q!-① Find the range of heights of any ten students of your class.

So¹ⁿ:- Let heights of 10 students are

142, 147, 120, 130, 144, 157, 151, 150, 132, 135 (In c.m.)

∵   Highest value = 157,   Lowest value = 120

∴   Range = highest value - lowest value

          Range = 157 - 120

          | Range = 37 |

—x—

Q:-② Organise the following marks in a class assessment. in a tabular form.

4, 6, 7, 5, 3, 5, 4, 5, 2, 6, 2, 5, 1, 9, 6, 5, 8, 4, 6, 7

Marks	Tally marks	No. of Student
1	I	1
2	II	2
3	I	1
4	III	3
5	TH††	5
6	IIII	4
7	II	2
8	I	1
9	I	1

(i) which number is the highest? ⇒ 9

(ii) which numbe is the lowest? ⇒ 1

(iii) what is range of the data?

So¹ⁿ:-   range = highest value - lowest value

          range = 9 - 1

          | range = 8 |

(iv) Find the arithmetic mean?

Soln:-

$$\text{mean} = \frac{\text{Sum of all observations}}{\text{Number of observations}}$$

$$\text{Mean} = \frac{4+6+7+5+3+5+4+5+2+6+2+5+1+9+6+5+8+4+6+7}{20}$$

$$= \frac{100}{20}$$

$$\boxed{\text{mean} = 5}$$

$$=x=$$

Q:-(3) Find the mean of the first five whole numbers.

Soln:- We know that first five whole number are

$$0,1,2,3,4$$

$$\left\{ \text{mean} = \frac{\text{Sum of numbers}}{\text{Total number}} \right.$$

$$\text{Mean} = \frac{0+1+2+3+4}{5} = \frac{10}{5} = 2$$

$$\boxed{\text{Mean} = 2}$$

$$=x=$$

Q:-(4) A cricketer scores the following runs in eight innings: 58, 76, 40, 35, 46, 45, 0, 100. Find the mean score.

Soln:-

$$\text{Mean} = \frac{\text{Sum of scores}}{\text{Number of Innings}}$$

$$= \frac{58+76+40+35+46+45+0+100}{8}$$

$$= \frac{400}{8}$$

$$\boxed{\text{mean} = 50}$$

Thus, the mean score is 50.

$$=x=$$

5. Following table shows the points of each player scored in four games:

Player	Game 1	Game 2	Game 3	Game 4
A	14	16	10	10
B	0	8	6	4
C	8	11	Did not Play	13

Now answer the following questions:

(i) Find the mean to determine A's average number of points scored per game.

(ii) To find the mean number of points per game for C, would you divide the total points by 3 or by 4? Why?

(iii) B played in all the four games. How would you find the mean?

(iv) Who is the best performer?

Solⁿ:- (i)

$$\text{mean of player A} = \frac{\text{Sum of Scores by A}}{\text{No. of games played by A}}$$

$$= \frac{14+16+10+10}{4}$$

$$= \frac{50}{4}$$

$$= 12.5$$

(ii) We should divide the total points by 3 because player C played only three games.

(iii)

$$\therefore \text{mean of player B} = \frac{\text{Sum of Scores by B}}{\text{No of games played by B}}$$

$$= \frac{0+8+6+4}{4}$$

$$= \frac{18}{4}$$

$$= 4.5$$

(iv) Player A is the best performer.

=×=

6. The marks (out of 100) obtained by a group of students in a science test are 85, 76, 90, 85, 39, 48, 56, 95, 81 and 75. Find the:

(i) Highest and the lowest marks obtained by the students.

(ii) Range of the marks obtained.

(iii) Mean marks obtained by the group.

Sol^n ⑥ ⇒ (i) Highest marks obtained by the student = 95

Lowest marks obtained by the student = 39

(ii) Range = highest marks − lowest marks

= 95 − 39

= 56

(iii)

$$\text{mean} = \frac{\text{Sum of marks}}{\text{Number of students}}$$

$$= \frac{85+76+90+85+39+48+56+95+81+75}{10}$$

$$= \frac{730}{10}$$

$$= 73$$

Thus, the mean marks obtained by students is 73.

=x=

Q:-⑦ The enrolment is a school during six consecutive years was as following!

1555, 1670, 1750, 2013, 2540, 2820

Find the mean enrolment of the school for this period.

Soln:-

$$\text{mean enrolment} = \frac{\text{Sum of numbers of enrolment}}{\text{Total numbers of years}}$$

$$= \frac{1555+1670+1750+2013+2540+2820}{6}$$

$$= \frac{12348}{6}$$

$$= 2058$$

Thus, the mean enrolment of the school is 2058.

=x=

Q:-⑧ The rainfall (in mm) is a city on 7 days of a certain week was recorded as follows:

Day	mon	Tue	Wed	Thurs	Fri	Sat	Sun
Rainfall (inmm)	0.0	12.2	2.1	0.0	20.5	5.5	1.0

(i) Find the range of the rainfall in the above data.
(ii) Find the mean rainfall for the week.

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(8)

Soln:- (i)   Highest rainfall = 20.5
               Lowest rainfall = 0.0

        Range = Highest rainfall – Lowest rainfall

              = 20.5 – 0.0

              = 20.5

(ii)

   mean = $\dfrac{\text{Sum of rainfall}}{\text{Total numbers of days}}$

        = $\dfrac{0.0 + 12.2 + 2.1 + 0.0 + 20.5 + 5.5 + 1.0}{7}$

        = $\dfrac{41.3}{7}$

        = 5.9

   Thus, mean rainfall for the week is 5.9 mm.

(iii) On how many days was the rainfall less than the mean rainfall
(iii)   5 days { mon, Wed, Thurs, Sat, Sun }

                        =×=

8:(9) The heights of 10 girls were measured in cm
so   and the results are as follows:

       135, 150, 139, 128, 151, 132, 146, 149, 143, 141.

   (i) what is the height of the tallest girl?

Ans!- The height of tallest girl = 151 cm
   (ii) what is the height of the shortest girl?

Ans- The height of shortest girl = 128 cm

(iii) What is the range of the data?

Sol^n:-   Range = ~~treig~~ Highest height - Lowest height

$$= 151 - 128$$

$$= 23 \text{ cm}$$

(iv) What is the mean height of the girls?

Sol^n:-

The mean height $= \dfrac{\text{Sum of heights of the girls}}{\text{Total number of girls}}$

$$= \frac{135 + 150 + 139 + 128 + 151 + 132 + 146 + 149 + 143 + 141}{10}$$

$$= \frac{1414}{10}$$

$$= 141.4 \text{ cm}$$

(v) How many girls have heights more than the mean height.

Sol^n:-   Five girls $\{150, 151, 146, 149, 143\}$

$$= X =$$