11. Statistics

- **Mean of a frequency distribution table**

  Formula to calculate mean from a frequency distribution table is given by,
  $\text{Mean}(\bar{x}) = \frac{\sum f_i x_i}{\sum f_i}$, where f_i and x_i are the frequencies and observations respectively.

  For example, consider the following data.

Marks (x_i)	Number of students (f_i)	$f_i x_i$
10	4	40
20	3	60
30	5	150
40	7	280
50	10	500
	$\sum f_i = 29$	$\sum f_i x_i = 1030$

Here, $\text{Mean}(\bar{x}) = \frac{1030}{29} = 35.52 \text{ (approx)}$

I. Subdivided bar diagram is constructed by drawing bars for each class considering the total magnitude of each class and then dividing the bars into different components.

Example:

The given table represents the marks obtained by Mohit and Shikha in four different subjects. Construct subdivided bar diagram for it.

Subject	Shikha's Marks	Mohit's Marks
English	15	30
Hindi	25	35
Math	10	40
Science	25	35

Solution:

Step 1: Calculate the total marks obtained by Mohit and Shikha.

Subject	Shikha's Marks	Mohit's Marks	Total marks
English	15	30	45
Hindi	25	35	60
Math	10	40	50
Science	25	35	60

Step 2: Follow the given steps to construct subdivided bar diagram.

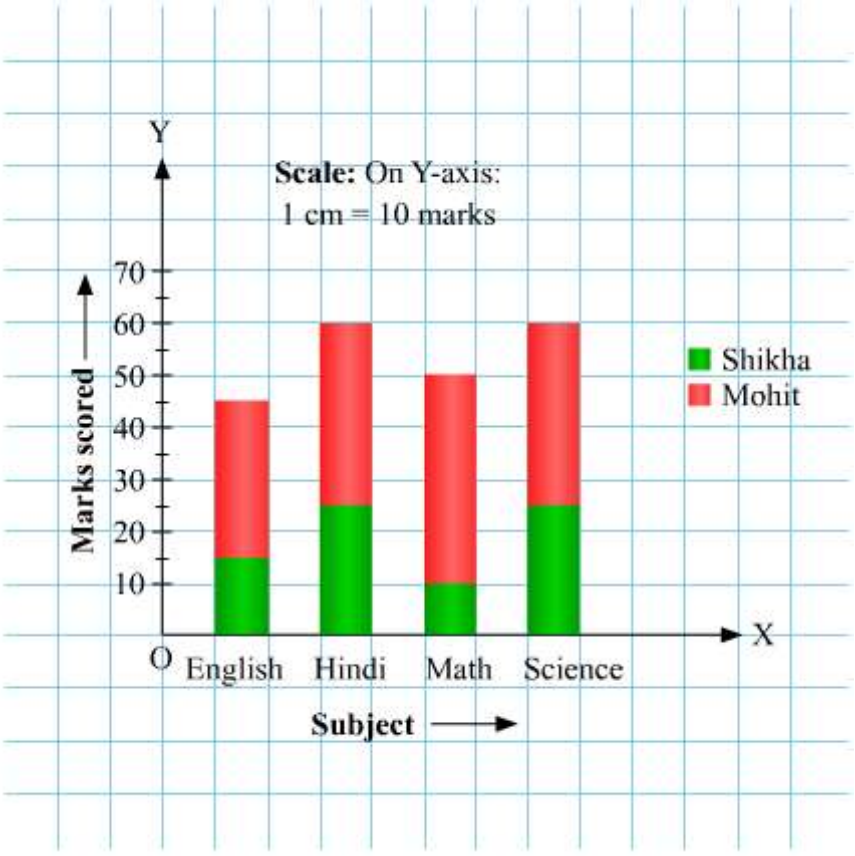
(i) Draw X and Y axes.

(ii) Mark subjects on X-axis by keeping equal gap between two consecutive subjects.

(iii) By choosing a proper scale, mark marks on Y-axis. Here, we take 1 cm = 10 marks.

(iv) Draw the bars of total marks for each subject.

(v) Divide each bar according to the marks obtained by Shikha and Mohit individually and shade or colour them to help differentiate.



3. We can extract information from subdivided bar diagram by observing it.

For example, according the above diagram, least marks were scored in English. Difference between marks scored by Mohit and Shikha in Math is 40 – 10 = 30.

II. Percentage bar diagram is a special type of subdivided bar diagram in which the height of each bar is 100.

Example: The given table shows the number of men and women in a town in three consecutive years. Construct percentage bar diagram for this information.

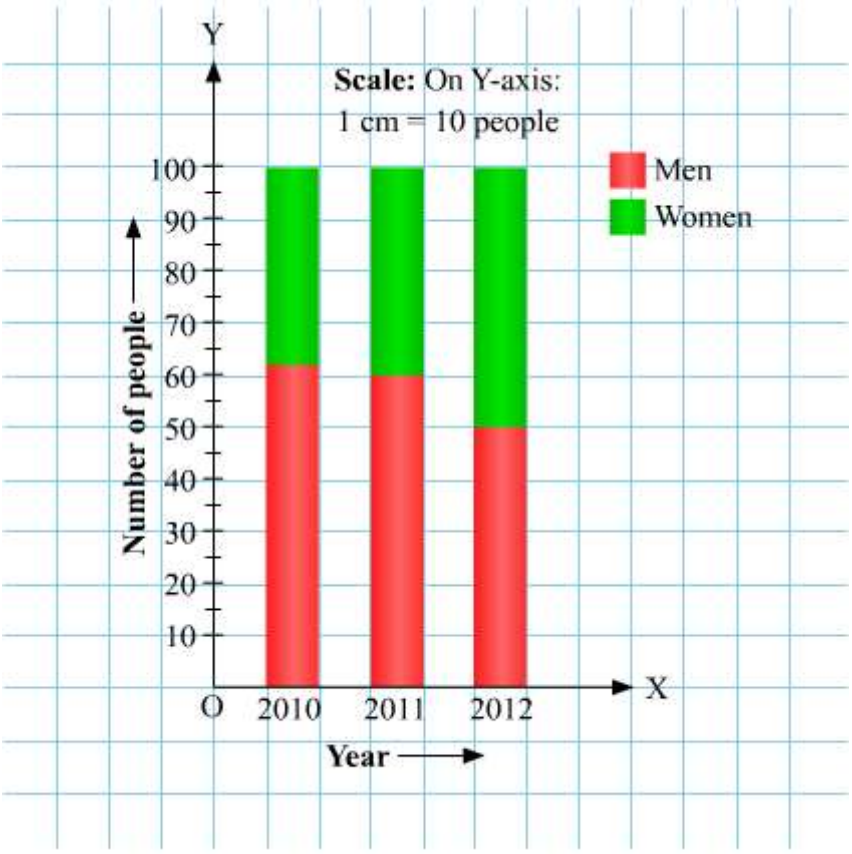
Year	2010	2011	2012
Number of men	2500	2700	2500
Number of women	1500	1800	2500

Solution:

Step 1: Calculate the percentage of men and women in each year.

Year	2010	2011	2012
Number of men	2500	2700	2500
Number of women	1500	1800	2500
Total people	4000	4500	5000
Percentage of men	$\frac{2500\times100}{4000}=62.5$	$\frac{2700\times100}{4500}=60$	$\frac{2500\times100}{5000}=50$
Percentage of women	100 –62.5 = 37.5	100 –60 = 40	100 –50 = 50

Step 2: The method to construct percentage bar diagram is same as that of subdivided bar diagram. We only need to draw bars of height 100 for each year.



3. We can extract information from a percentage bar diagram in the similar manner as from a subdivided bar diagram.