Draw Histograms For Classes Of Equal Widths & Varying Widths

Objective

To draw histograms for classes of equal widths and varying widths.

Materials Required

1. Graph paper
2. Geometry box
3. Adhesive
4. Sketch pens
5. Scissors
6. A piece of cardboard

Prerequisite Knowledge

1. Knowledge about collection of data.
2. Concept of histogram.

Theory

1. **Collection of Data**
   The facts or figures which are numerical or otherwise; collected with a definite purpose (i.e. observation/information collected), are called data. Data is the plural form of the Latin word datum. Some basic terms related to data are given below:

   - The data collected by the investigator himself for a definite plan or purpose is known as
     primary data.
   - The data collected by someone and used by any other person is known as secondary data.
   - The data obtained in original form is called raw data or ungrouped data.
   - We may condense data into classes or groups such a presentation is known as grouped data.

2. **Histogram**
   A histogram is the graphical representation of a grouped frequency distribution with continuous classes in the form of rectangles with class intervals as bases and the corresponding frequencies as heights. There being no gap between any two consecutive rectangles.
   Histogram is commonly used to show frequency distribution.

Procedure

1. Firstly, collect the data from daily life such as weights/heights of children in a class, then make a frequency distribution table.

Case I For classes of equal widths,

Class	a-b	b-c	c -d	d -e	e-f
Frequency	f1	f2	f3	f4	f5

Case II For classes of varying widths,

Here, d – f = 2(a-b)

Class	a-b (width x)	b-c (width x)	c-d (width x)	d-f (width 2x)
Frequency	f1	f2	f3	f4
Modified frequency	f1	f2	f3	F' = $\frac{f_4}{2}$

2. Take a graph paper having dimensions (20cm x 20cm) and paste it on a piece of cardboard sheet.

3. Now, draw two perpendicular axes X'OX and Y'OY on the graph paper, (see Fig. 32.1)

4. At equal distances, mark classes on X-axis and frequency Y-axis, (see Fig. 32.1)

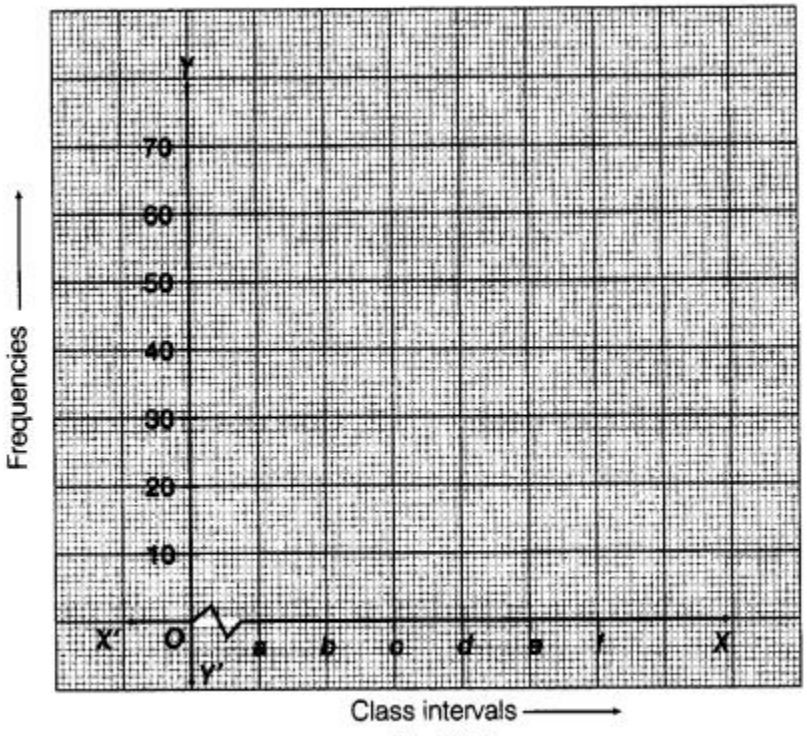

Fig. 32.1

5. Draw rectangles of equal widths and heights f_1, f_2, f_3, f_4 and f_5 on intervals (a-b), (b-c), (c-d), (d-e) and (e-f), respectively, (see Fig. 32.2)

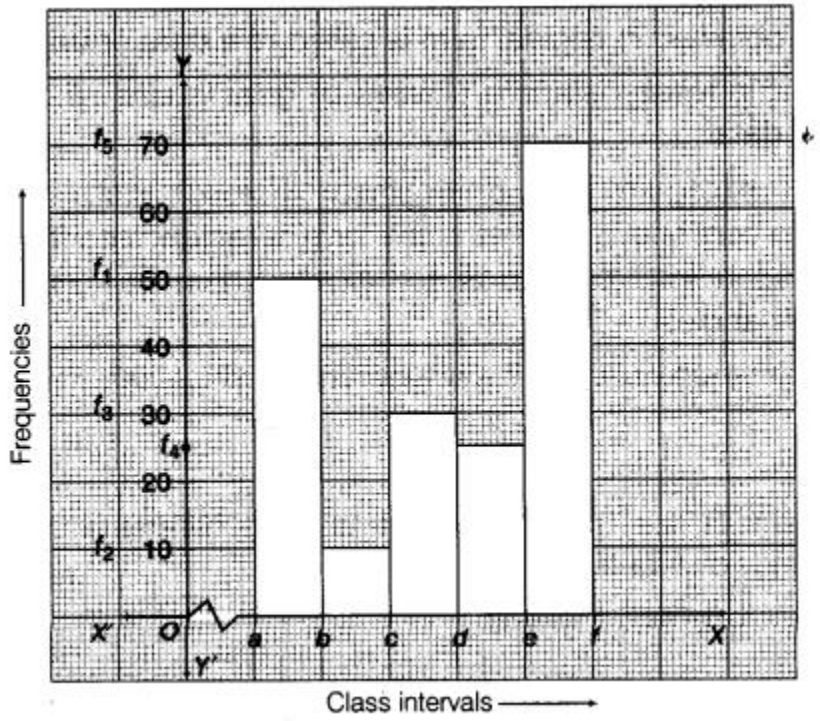

Fig. 32.2

6. Draw rectangles of heights f_1, f_2, f_3 and F' on intervals (a-b), (b-c), (c-d) and (d-f) respectively, (see Fig. 32.3)

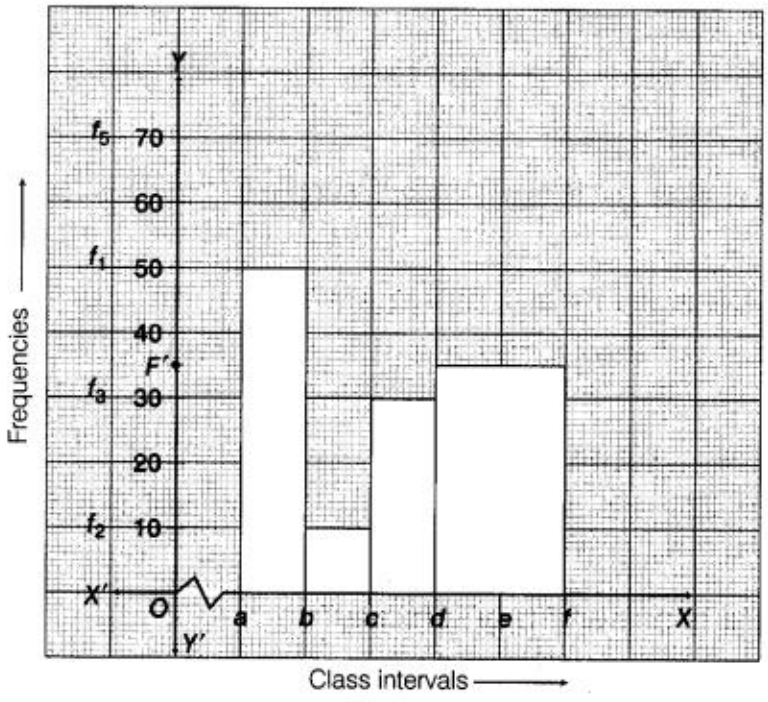

Fig. 32.3

Demonstration

On taking different numerical values of a, b, c, d, e and f, histogram of equal widths and varying widths can be drawn.

Observations

Case I For the classes of equal widths,

1. The intervals are
   a-b = ……..
   b-c = ……
   c-d = ……..
   d-e = …….
   e-f = ……..
2. f_1 = ……
   f_2 = ……..
   f_3 = ……
   f_4 = ……
   f_5 = ……..

Case II For the classes of varying widths,

1. The intervals are
   a-b = ……..
   b-c = ……
   c-d = ……..
   d-f = …….
2. f_1 = ……
   f_2 = ……..
   f_3 = ……
   f_4 = ……
   F' = $\frac{f_4}{2}$ = ……..

Result

We have drawn histogram of equal widths and varying widths by using the collected data.

Application

Histograms can be used pictorially in representing large data in a concise form.

Viva-Voce

Question 1.

How will you define the statistics?

Answer:

Statistics deals with the collection, organisation, analysis and interpretation of data.

Question 2.
What do you mean by data?

Answer:
The facts or figures which are numerical or otherwise collected with a definite purpose are called data.

Question 3.
What do you understand by a primary data?

Answer:
When the information was collected by the investigator herself or himself with a definite objective in her or his mind, the data obtained is called primary data.

Question 4.
How will you define a secondary data?

Answer:
When the information was gathered from a source which already had the information stored, the data obtained is called secondary data.

Question 5.
In what form, data is presented graphically?

Answer:
Data can be presented graphically in the form of bar graph, histogram and frequency polygons.

Question 6.
How will you define a histogram?

Answer:
A histogram is the graphical representation of a grouped frequency distribution with continuous classes in the form of rectangles with class intervals as bases and the corresponding frequencies as heights.

Question 7.
What is the singular form of data?

Answer:
Datum

Question 8.
What do you understand by grouped data?

Answer:
Grouped data is a statistical term used in a data analysis. A raw data set can be organised by constructing a table showing the frequency distribution of the variable {whose values are given in the raw data). Such a frequency table is often referred to as grouped data.

Suggested Activity

Draw histograms for number of students in each section of class IX of your school.