PHYSICAL EDUCAION

Subject : Physical Education
Semester : 4th
Paper No. and Title : (401) Test, Measurement and Evaluation in Physical Education

Graphical Representations of Data

1.0 Objective:

Visualization techniques are ways of creating graphical representations of data. We use these representations in order to gain better knowledge and understanding. In this unit we will be able to know

- Different types of graphical representation.

1.1 Histogram:

The most common form of graphical presentation of data is histogram. The values of the variable are taken on the horizontal axislscale known as X-axis and the frequencies are taken on Y-axis. For each class interval a rectangle is drawn with the base equal to the length of the class interval (C.I.) and height according to the frequency of the C.I. here two case arises. When C.I. are of equal length, which would generally be the case in the type of data you are likely to handle in school situations, the heights of rectangles must be proportional to the frequencies of the Class Intervals. When the C.I. are not of equal length, the areas of rectangles must be proportional to the frequencies indicated (most likely you will not face this type of situation). As the C.1.s for any variable are in continuity, the base of the rectangles also extends from one boundary to the other in continuity. These boundaries of the C.1.s are indicated on the horizontal scale. The frequencies for determining the heights of the rectangles are indicated on the vertical scale of the

graph. Let us prepare a histogram for the frequency distribution of mathematics score of 120 Class X students (Table 1). In this case, 1 cm on X-axis representing 5 scores and 1 cm on Y-axis representing a frequency of 2. (see fig 1)

Table-1

Scores	Frequency
90 -99	11
80-89	18
70-79	20
60-69	25
50-59	21
40-49	18
30-39	7
Total	120

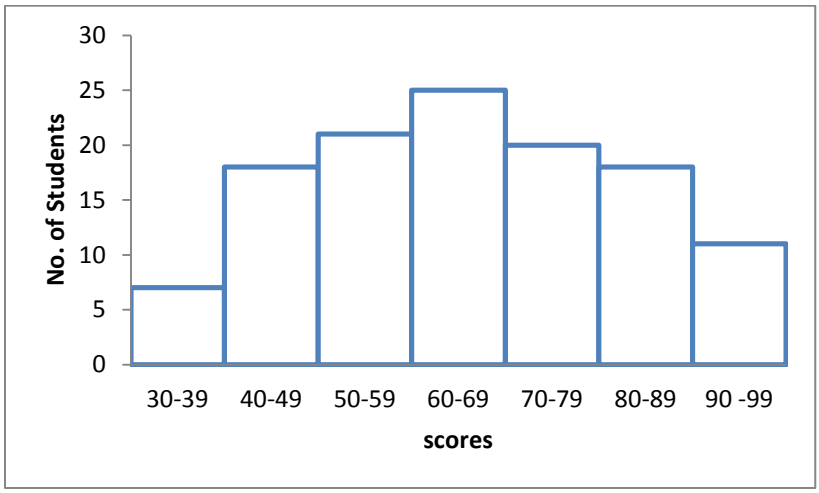

Fig:1 histogram

1.2 Bar Diagram:

For discrete variable histogram cannot be constructed as the classes are not comparable in terms of magnitude. However, a simple graphical presentation, quite similar to histogram, known as bar graph, may be constructed. (See fig.2)The height of the bars are proportionate to the respective frequencies.. If two variables are used simultaneously, even then bar graphs may be quite effective. For example, if along with the total number of schools (management-wise) the

number of boys' schools, girls' schools are also to be indicated then this can be done by using different colours in the same graph paper

Table-2

Management	No. of Schools
Government	4
Local body	8
Private Aided	10
Private unaided	2
Total	24

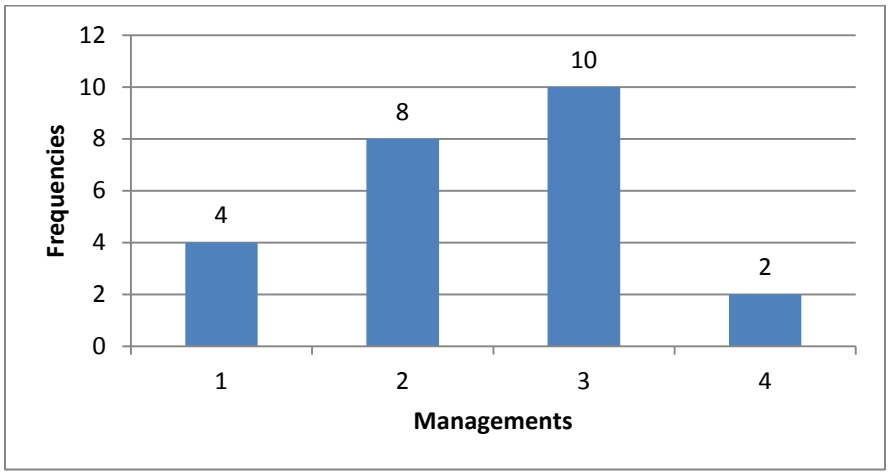

Fig:2 bar diagram

1.3. Cumulative Frequency Curve:

For plotting a cumulative frequency(C.F.) curve which is also known as Ogive, first of all cumulative frequencies against each class are to be written. In table-3 C.F. indicates that upto 39.5 there are 7 cases, upto 49.5 there are 25 cases etc. The difference between the construction of the frequency polygon and ogive is that in case of frequency polygon, one takes the mid points of the class interval(C.I). on horizontal axis, where for the construction of ogive one takes the upper boundary of the C.I. on horizontal axis. Again on the vertical axis, in case of Ogive one

tzkes cumulative frequency/cumulative percentage instead of frequency only. The cumulative frequency curve or Ogive for the given data in Table 3, is shown in Fig. 3

Table-3

Scores	Frequency	Cumulative Frequency
30-39	7	7
40-49	18	25
50-59	21	46
60-69	25	71
70-79	20	91
80-89	18	109
90-99	11	120

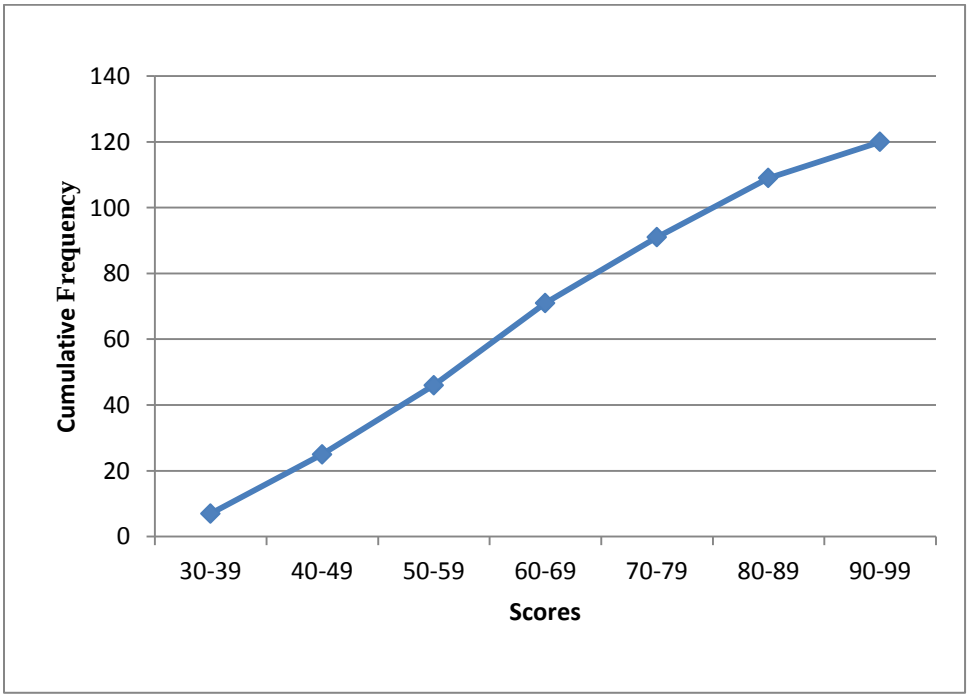

Fig 3: ogive

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1.4 Frequency Polygon

In the making of histogram, the values of the variable are taken on the horizontal axis of the graph and the frequencies are taken on the vertical axis of the graph. In the case of a

frequency polygon, one has to indicate the mid points of the class interval in the horizontal axis, instead of indicating the boundaries of the interval, Here the mid point of the intervals just before the lowest interval and just after the highest interval are also to be indicated. Now by taking the mid points one by one, the points above them are to be plotted corresponding to the frequencies of the intervals. In case of the two additional mid points, the frequency being zero, the points to be plotted are on the X-axis itself. The adjoining points so plotted are to be jained by straight line segments. (see Figure 4.)

Table 4

Scores	Frequency
90 -99	11
80-89	18
70-79	20
60-69	25
50-59	21
40-49	18
30-39	7
Total	120

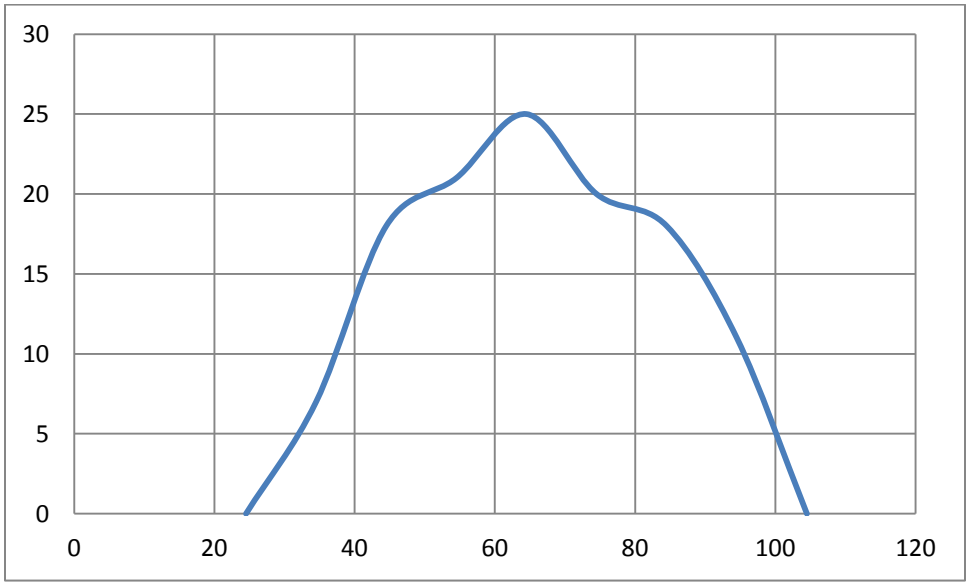

Fig. 4: frequency polygon