Quantitative Aptitude

Unit-III

Numerical estimation: Applications based on Percentages, Profit Loss and Discount, Simple interest and Compound Interest Partnerships, Shares and dividends

Data interpretation: Data interpretation related to Averages, Bar charts, Pie charts, Venn diagrams, Line graphs

Numerical Reasoning: Problems related to Number series, Analogy of numbers, Classification of numbers, Letter series, Seating arrangements, Directions, blood relations and puzzle test.

Data interpretation: Data interpretation related to Averages, Bar charts, Pie charts, Venn diagrams, Line graphs

What is Data Interpretation?

Data interpretation is the process of reviewing provided data and using these data for calculating the required value. The data can be provided in various forms like in table format, pie chart, line graph, bar graph, or a combination of these.

What is Data Interpretation Method?

Data interpretation method is a way to analyze and help people make sense of numerical data which has been collected, analyzed and presented. When data is collected, it normally stays in a raw form which may be difficult for the normal person to comprehend and that is why analysts always try to break down the information gathered so that others can make sense of it.

For instance, when Founders present their pitches to his or her potential investors, they do that by interpreting the data such as market size, growth rate and so on for better understanding. There are 2 principal methods by which data interpretation can be done:

1. Qualitative methods
2. Quantitative methods

Qualitative Data Interpretation Method

Qualitative data interpretation method is used to analyze qualitative data which is often termed as categorical data. This approach uses texts, rather than numbers or patterns to represent data. Qualitative data requires first to be coded into numbers before it can be analyzed. As the texts are usually cumbersome and take more time. Coding done by the analyst is also documented so that it can be reused by others and also examined further.

There are 2 main types of qualitative data, such as nominal and ordinal data. These two data types are both performed using the same method, but ordinal data interpretation is easier than that of nominal data.

In most of the cases, ordinal data is usually labeled with numbers throughout the process of data collection, and so many times coding may not be required. This is different from nominal data which still requires to be coded for proper interpretation.

Quantitative Data Interpretation Method

Quantitative data interpretation method is used to analyze quantitative data which is also termed as numerical data. This data type includes numbers and is therefore can be analyzed with the help of numbers and not texts.

Quantitative data can be categorized into two main types, such as discrete and continuous data. Continuous data is further divided into interval data and ratio data, with all the data types being numeric.

Due to its natural existence as a number, analysts do not need to use the coding method on quantitative data before analyzing it. The process of analyzing quantitative data requires statistical modeling techniques namely standard deviation, mean and median.

Types of Data Interpretation

The various types of Data Interpretation are given below:

Data interpretation:

Data interpretation related to Averages,

Bar charts,

Pie charts,

Venn diagrams,

Line graphs

Pie Charts

Pie charts, or circle graphs, are used extensively in statistics. These graphs appear often in newspapers and magazines. A **pie chart** shows the relationship of the parts to the whole by visually comparing the sizes of the sections (slices). Pie charts can be constructed by using a hundreds disk or by using a circle. The hundreds disk is built on the concept that the whole of anything is 100%, while the circle is built on the concept that 360° is the whole of anything. Both methods of creating a pie chart are acceptable, and both will produce the same result. The sections have different colors to enable an observer to clearly see the differences in the sizes of the sections. The following example will first be done by using a hundreds disk and then by using a circle.

Example 10

The Red Cross Blood Donor Clinic had a very successful morning collecting blood donations. Within 3 hours, people had made donations, and the following is a table showing the blood types of the donations:

Blood Type	A	B	O	AB
Number of donors	7	5	9	4

Construct a pie chart to represent the data.

Solution:
Step 1: Determine the total number of donors: $7+5+9+4=25$.
Step 2: Express each donor number as a percent of the whole by using the formula $\text{Percent}=\frac{f}{n}\cdot 100\%$, where f is the frequency and n is the total number.

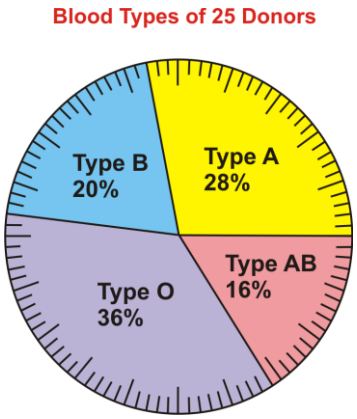
$\frac{7}{25}\cdot 100\%=28\%$

$\frac{5}{25}\cdot 100\%=20\%$

$\frac{9}{25}\cdot 100\%=36\%$

$\frac{4}{25}\cdot 100\%=16\%$

Step 3: Use a hundreds disk and simply count the correct number for each blood type (1 line = 1 percent).
Step 4: Graph each section. Write the name and correct percentage inside the section. Color each section a different color.



Bar Graphs

The different types of graphs that you have seen so far are plots to use with quantitative variables. A qualitative variable can be plotted using a bar graph. A **bar graph** is a plot made of bars whose heights (vertical bars) or lengths (horizontal bars) represent the frequencies of each category. There is 1 bar for each category, with space between each bar, and the data that is plotted is discrete data. Each category is represented by intervals of the same width. When constructing a bar graph, the category is usually placed on the horizontal axis, and the

frequency is usually placed on the vertical axis. These values can be reversed if the bar graph has horizontal bars.

Example 14

Construct a bar graph to represent the depth of the Great Lakes:

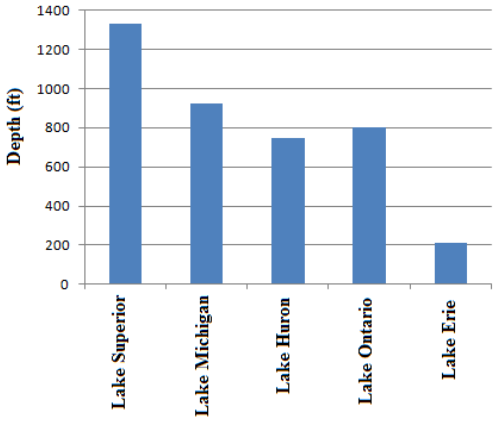
Lake Superior – 1,333 ft.

Lake Michigan – 923 ft.

Lake Huron – 750 ft.

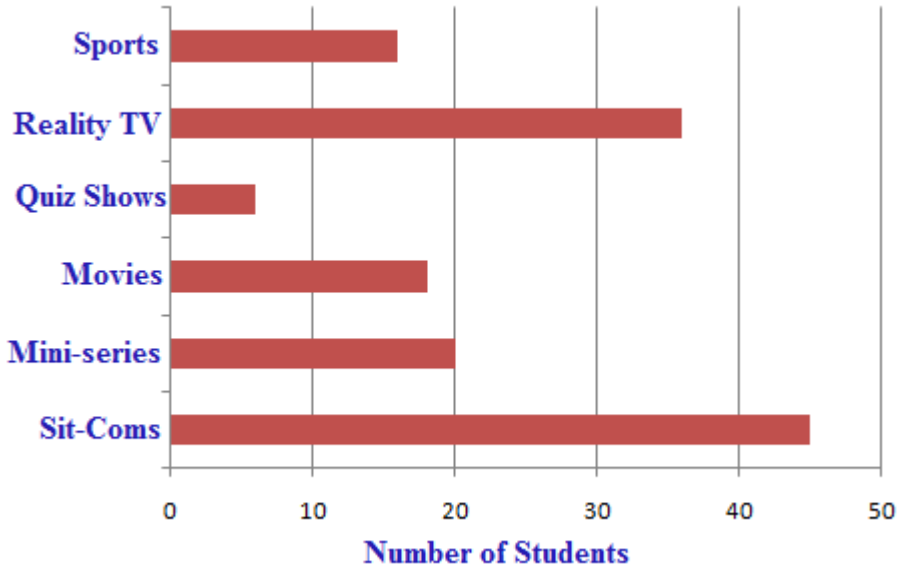
Lake Ontario – 802 ft.

Lake Erie – 210 ft.



Example

The following bar graph represents the results of a survey to determine the type of TV shows watched by high school students:



Use the bar graph to answer the following questions:

1. What type of show is watched the most?
2. What type of show is watched the least?
3. Approximately how many students participated in the survey?
4. Does the graph show the differences between the preferences of males and females?

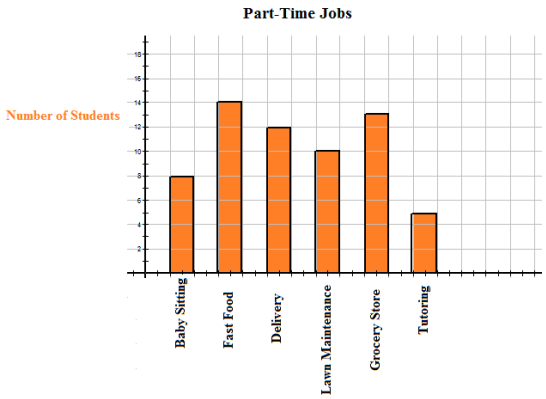
Solution:

1. Sit-coms are watched the most.
2. Quiz shows are watched the least.
3. Approximately $45+20+18+6+35+16=140$ students participated in the survey.
4. No, the graph does not show the differences between the preferences of males and females.

If bar graphs are constructed on grid paper, it is very easy to keep the intervals the same size and to keep the bars evenly spaced. In addition to helping in the appearance of the graph, grid paper also enables you to more accurately determine the frequency of each class.

Example 16

The following bar graph represents the part-time jobs held by a group of grade 10 students:



Using the above bar graph, answer the following questions:

1. What was the most popular part-time job?
2. What was the part-time job held by the least number of students?
3. Which part-time jobs employed 10 or more of the students?
4. Is it possible to create a table of values for the bar graph? If so, construct the table of values.
5. What percentage of the students worked as a delivery person?

Solution:

1. The most popular part-time job was in the fast food industry.

2. The part-time job of tutoring was the one held by the least number of students.

3. The part-time jobs that employed 10 or more students were in the fast food, delivery, lawn maintenance, and grocery store businesses.

4. Yes, it's possible to create a table of values for the bar graph.

Part-Time Job	Baby Sitting	Fast Food	Delivery	Lawn Care	Grocery Store	Tutoring
Number of Students	8	14	12	10	13	5

5. The percentage of the students who worked as a delivery person was approximately 19.4%.

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8+14+22+18
                62
12/62
        .1935483871
Ans*100
       19.35483871
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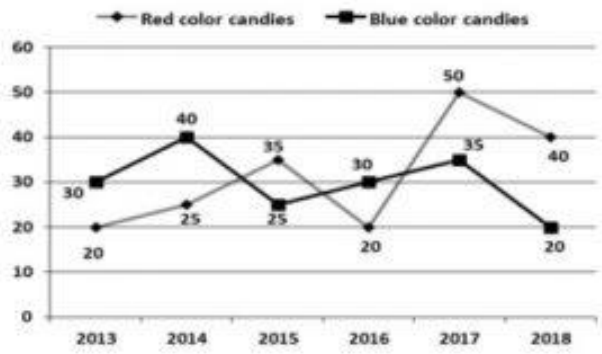
line graph

Example : Directions: Read the following line graph carefully and answer the given questions below: Following line graph shows the number of red and blue colored candies (in lakhs) produced in 6 different years. Candies produced of red color in 2018 are what percentage less/more than candies produced of red color in 2017?



Solution: Candies produced of red color in 2018 = 40 lakhs

Candies produced in red color in 2017 = 50 lakhs

Required percentage = (50 – 40)/50 × 100 = 20%.

Example : Find the difference between a total number of red color candies and a total number of blue color candies produced throughout the 6 years.

Solution: Total number of red color candies = 20 + 25 + 35 + 20 + 50 + 40 = 190 lakhs Total number of blue color candies = 30 + 40 + 25 + 30 + 35 + 20 = 180 lakhs

Required difference = 190 – 180 = 10 lakhs.