Basics of Data Interpretation

Introduction

By interpretation of data we mean understanding, organizing and drawing appropriate conclusions from the given data. In these days, Data Interpretation is an important aspect of almost every competitive examination. Usually, a table or a bar diagram or a pie-chart or a graph is given and candidates are asked questions that test their ability to analyze the data given in those forms. Through these questions, examiner makes an attempt to check your ability to calculate faster and to comprehend complex and voluminous data. As a manager of tomorrow, you will constantly come across tones of data daily in different forms.

Unorganized and haphazard data does not make any sense — more so to top management for whom time is A very valuable and rare commodity. Hence, any data, be it daily production figures, daily sales figures, financial performanceorproductivity,willhavetobepresentedinaconcisemanner—atthesametimebeing precise so that top management can study it with least of effort and time thus also facilitating faster decision making.

Methods of Presenting Data

Numerical data can be presented in one or more of the following ways:

(i) Table

(ii) Line Graph

(iii) Bar Graph

(iv) Pie-Chart

(v) Venn Diagram,

(vi) Case lets

(vii) Triangular Bar Diagram

(viii) Mix Diagram (combination of two or more of the above forms)etc.

Presentation of Given Data into Different Forms

1. Table

Ex.1: ***The following table shows the sale(in million) of the companies A, B, C, D and E for the years 2000 to2004.***

Name of companies	Years				
	2000	2001	2002	2003	2004
A	374	416	439	588	532
B	400	520	390	610	740
C	380	420	510	690	760
D	450	540	650	710	840

E	530	620	720	750	640

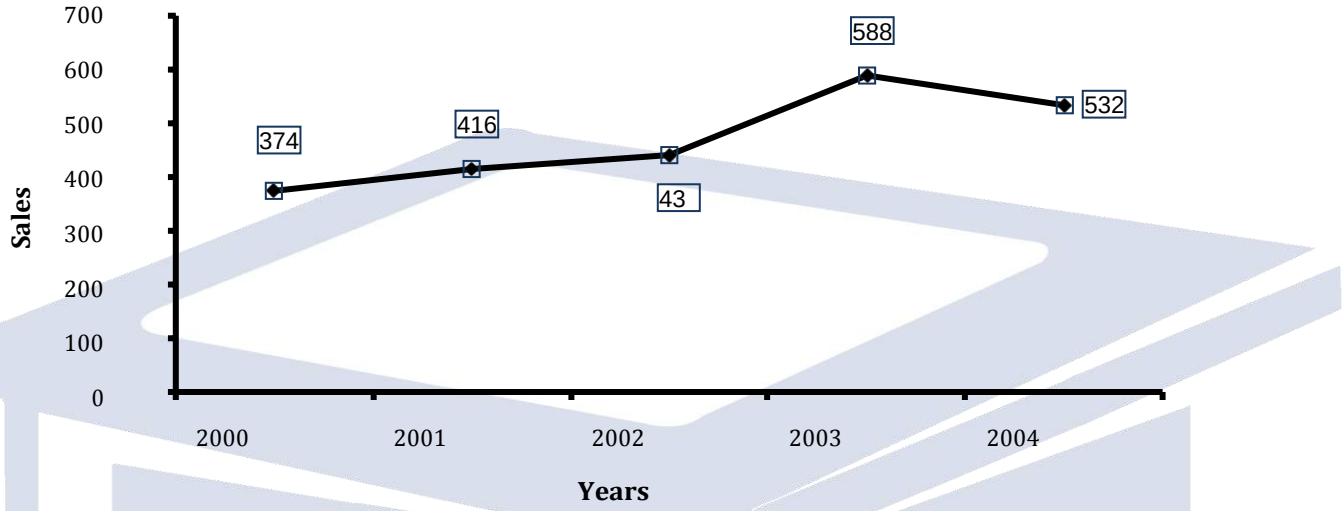
Table 1

2. Line Graph

(a) Simple Line Graph

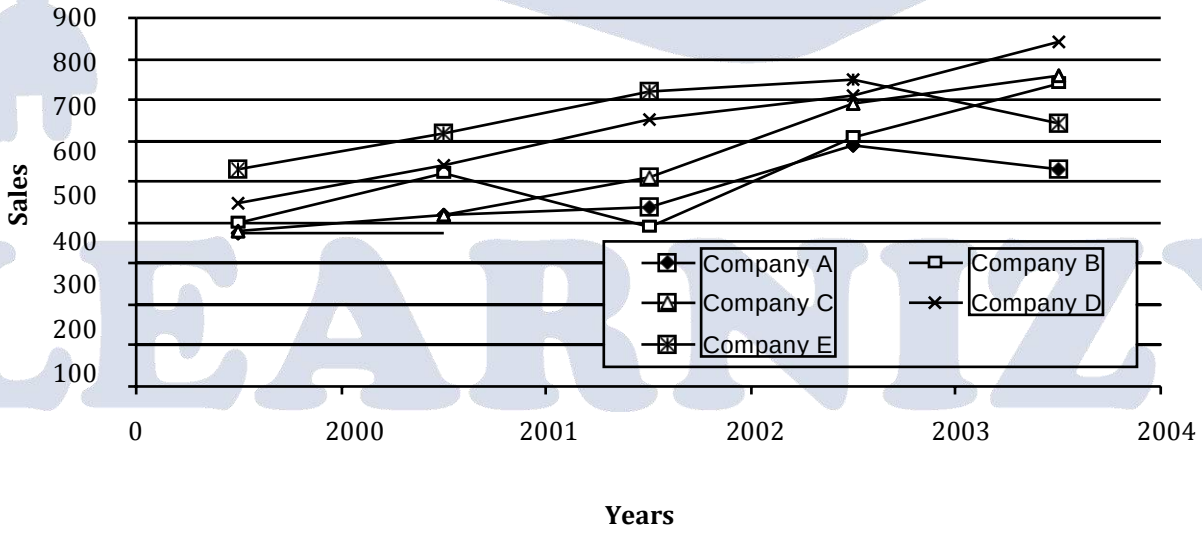
Ex.: ***The sale of Company D can be expressed by a line graph as given below:***

Annual sale of Company A (in `million) from 2000 to 2004.



(b) Multiple Line Graph

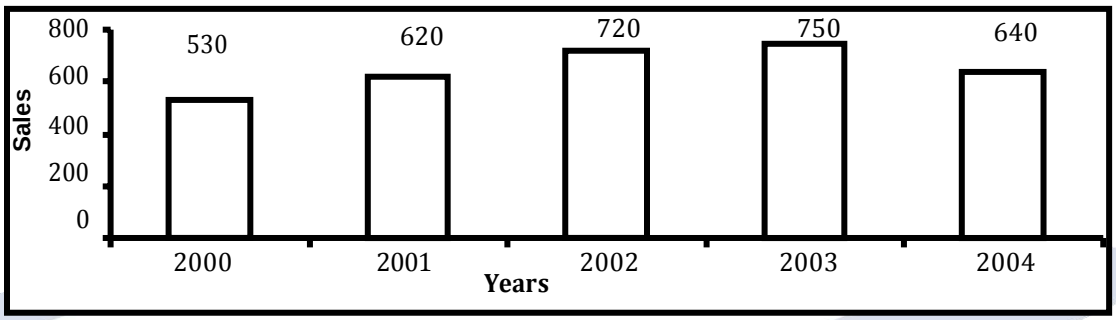
Ex. 3: From the table 1, annual sale of all the five companies A, B, C, D and E from 2000 to 2004 may be expressed by multiple line graph as given below: (Figures in `million)



3. Bar Graph

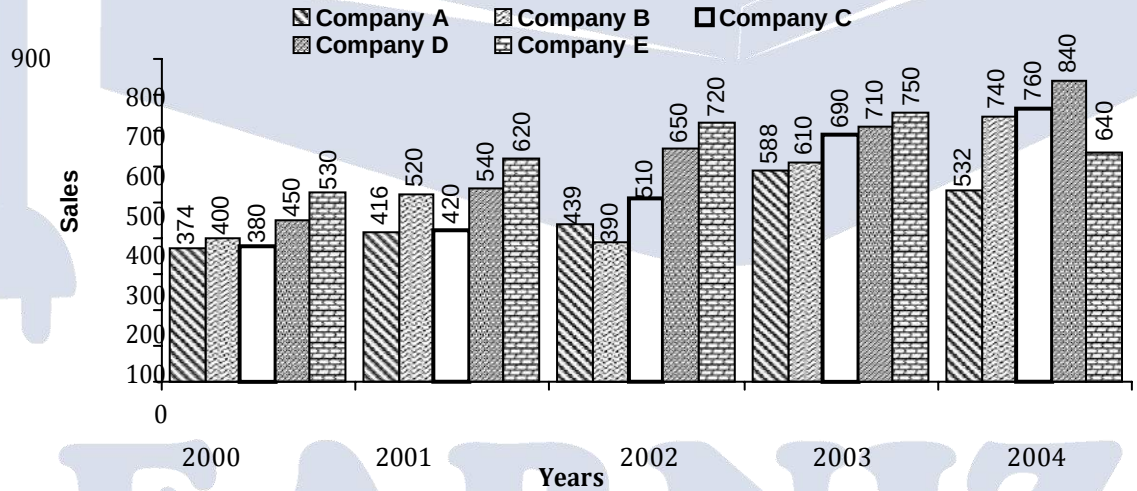
Simple Bar Graph

Ex. 4: ***From the table 1, the annual sale of Company E from the year 2000 to 2004 may be expressed by means of bar graph in the following way:*** **(Figures in `million)**



(a) Multiple Bar Graph

Ex. 5: ***From the table 1, the annual sale of the companies A, B, C, D and E from year 2000 to 2004 is expressed by means of multiple bar graph:*** **(Figures in `million).**



Multiple Bar Graph

4. Pie-Chart

Pie-Charts (also called Circle-Charts) are used to represent the relative sizes of component in an aggregate. Pie-Chart is a circle broken down into component sectors. Therefore, in pie-chart different data are represented by sectors. Pie-Chart is generally used on a percentage basis and not on an absolute bas is. Different sectors of a Pie-Chart represent various component parts. Each component value is expressed either as a percentage of respective total or as the Central Angle of the respective total.

$$\text{Central Angle} = \left(\frac{\text{Value of the sector}}{\text{Total Value}} \times 360\right)$$

$$\text{Value of the Sector} = \frac{\text{Central Angle}}{360^\circ} \times \text{Total Value}$$

[Since the angle at the center of the circle is 360°, the total magnitude of the various components is taken to be equal to360°]

Total magnitude of the various components is equal to100%. Therefore,100% ≡360°

$$(360^\circ / 100) = (3.6)^\circ$$

$$= (18/5)^\circ$$

Hence, the percentage of the component parts can be converted into degrees by multi plying each of them by(3.6)°.

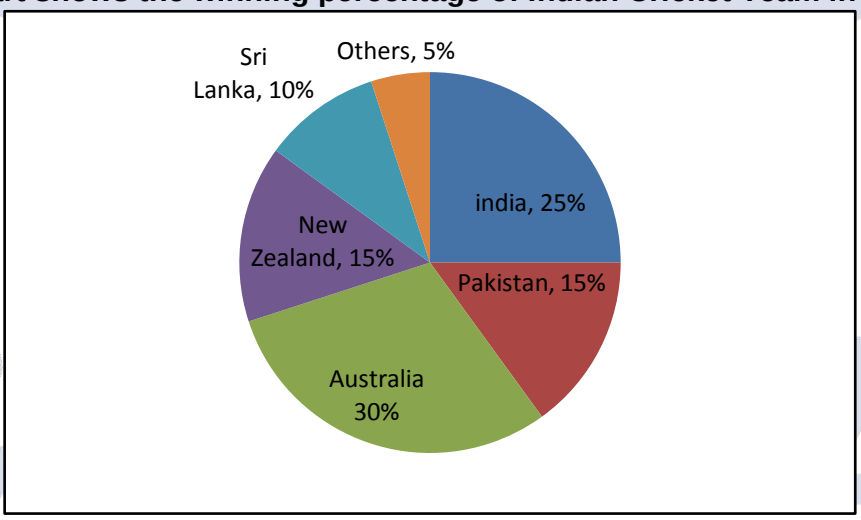
$$\frac{\text{Central Angle}}{360^\circ} \times 100\ \%$$

$$\text{Central Angle} = \left(\frac{\text{Percentage Part of Total Value}}{100} \times 360^\circ\right)^\circ$$

Let us see the following examples that will illustrate the above points better:

I. Computation of Central Angle when each component value is expressed as a percentage of the respective total:

The following Pie-Chart shows the winning percentage of Indian Cricket Team in 2011



The above pie-chart can be represented as given below:

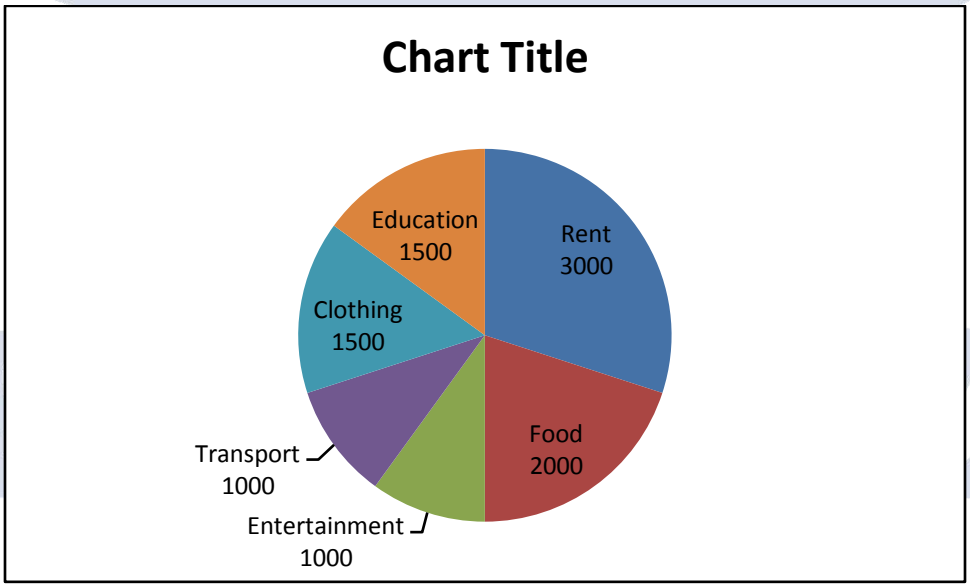
Cricket Team	India	Pakistan	Australia	New Zealand	Sri Lanka	Others
Winning Percentage	25	15	30	15	10	5

Cricket Team	Winning Percentage	Central Angle
India	25	$\left(\frac{25}{100}\times 360^\circ\right)^\circ = 90^\circ$
Pakistan	15	$\left(\frac{15}{100}\times 360^\circ\right)^\circ = 54^\circ$
Australia	30	$\left(\frac{30}{100}\times 360^\circ\right)^\circ = 108^\circ$
New Zealand	15	$\left(\frac{15}{100}\times 360^\circ\right)^\circ = 54^\circ$
Sri Lanka	10	$\left(\frac{10}{100}\times 360^\circ\right)^\circ = 36^\circ$
Others	5	$\left(\frac{5}{100}\times 360^\circ\right)^\circ = 18^\circ$

II. ***Computation of Central Angle when each component value is expressed as a part of the total value:***

The following Pie-Chart shows the expenditure distribution of a certain family(in `)

Total Expenditure = `10000



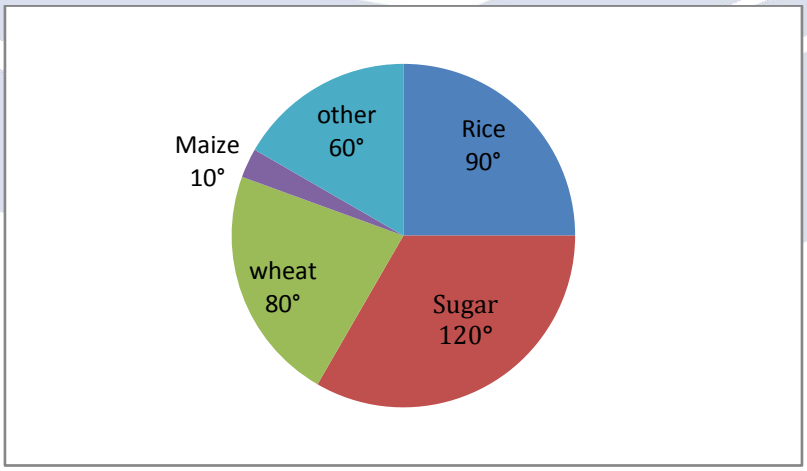
The above pie-chart can be represented as given below:

Items	Rent	Food	Entertainment	Transport	Clothing	Education
Expenditure (in `)	3000	2000	1000	1000	1500	1500

Items	Expenditure (in ₹)	Central Angle
Rent	3000	$\left(\frac{3000}{10000}\times 360^\circ\right)^\circ = 108^\circ$
Food	2000	$\left(\frac{2000}{10000}\times 360^\circ\right)^\circ = 72^\circ$
Entertainment	1000	$\left(\frac{1000}{10000}\times 360^\circ\right)^\circ = 36^\circ$
Transport	1000	$\left(\frac{1000}{10000}\times 360^\circ\right)^\circ = 36^\circ$
Clothing	1500	$\left(\frac{1500}{10000}\times 360^\circ\right)^\circ = 54^\circ$
Education	1500	$\left(\frac{1500}{10000}\times 360^\circ\right)^\circ = 54^\circ$

III. Computation of percentage component when central angle of the respective total is given:

The following Pie-Chart shows the annual agricultural yield of a village



The above Pie-Chart can be represented as given below:

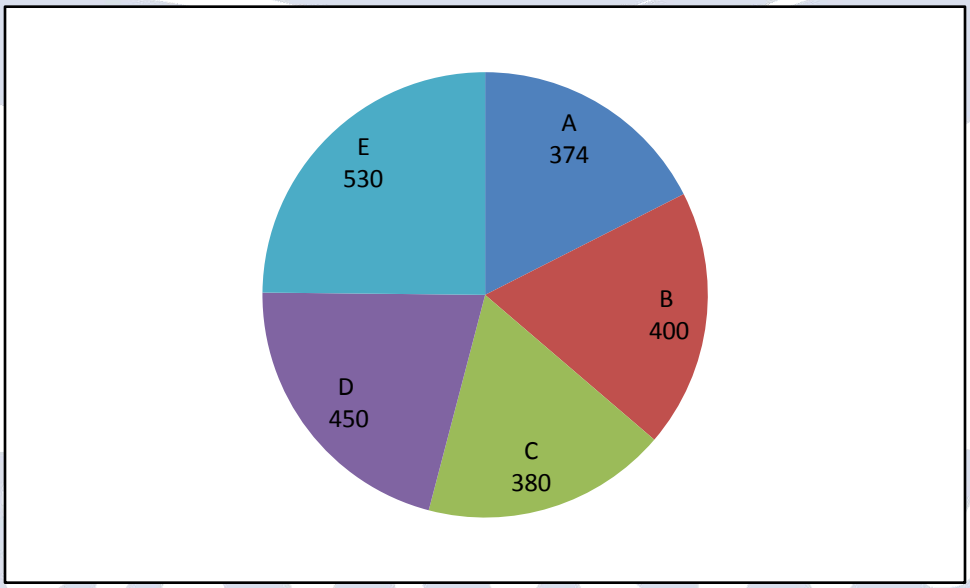
Agricultural Product	Rice	Sugar	Wheat	Maize	Others
Sector Angle	90°	120°	80°	10°	60°

Agricultural Product	Central Angle	Percentage Part of Total Value
Rice	90°	$\left(\frac{90}{360}\times 100\right)=25\%$
Sugar	120°	$\left(\frac{120}{360}\times 100\right)=\frac{100}{3}\%$
Wheat	80°	$\left(\frac{80}{360}\times 100\right)=\frac{200}{9}\%$
Maize	10°	$\left(\frac{10}{360}\times 100\right)=\frac{25}{9}\%$
Others	60°	$\left(\frac{60}{360}\times 100\right)=\frac{50}{3}\%$

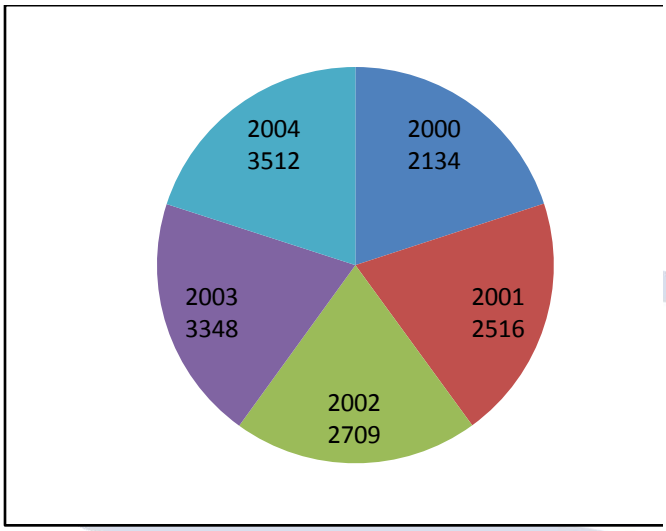
(a) Simple Pie-Chart

Ex. 6: ***from the table 1, the percentage market sale in the year 2000 of the companies a, B, C, D and E can be expressed as given below:***

Total sales for the year 2000 = 2134 million

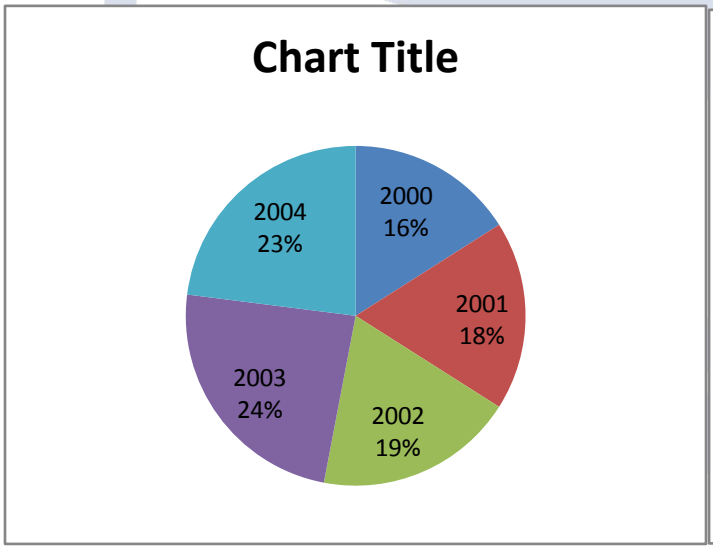


Ex. 7: ***from the table 1, the total sale of the companies a, B, C, D and E for the years 2000 to 2004 can be depicted as given below.***

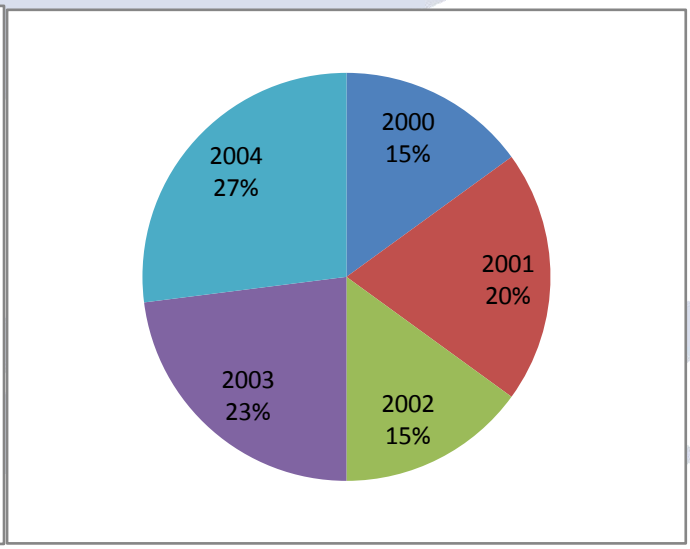


b) Multiple Pie-Chart

Ex. 8: ***From the table 1, the sale of companies A and B for the years 2000 to 2004 is expressed as given below. This type of Pie-Chart is used for the purpose of comparison.***



Company A



Company B

Types of Problems Related to Data

We will discuss, in this section, only different types of problems. Problems associated with any data can be divided into the following types:

- Percentage Related Problems
- Multiplying Fraction
- Income-Expenditure related Problems
- Average Related Problems
- Allegation Based Problems
- Ratio Based Problems
- Set Theory Based Problems

The above approach provides the student a deeper understanding of various types of data representation and prepares the students for the variety of questions that can be expected from a data. A careful study of techniques and tools mentioned in this section will equip the students to attempt all the questions on a particular data set. Most of the questions in the DI Section usually appear in any one of the following types: