UNIT 25 TABLES, CHARTS AND GRAPHS

Structure

25.0 OBJECTIVES

After going through this unit you will be able to :

- understand the function of tables, charts, and graphs,
- interpret and analyse the data presented in the form of tables, charts and graphs, and
- use these devices to communicate information more effectively.

25.1 INTRODUCTION

We have, in the various units so far, discussed the skills of written and spoken communication. In this unit, we shall discuss a method of communication which is slightly different, i.e. communication by means of tables, charts, and graphs. These devices supplement the information presented through words and help the reader to understand the facts and figures more easily.

25.2 THE FUNCTION OF TABLES, CHARTS AND GRAPHS

- The use of tables, charts and graphs enables you to highlight the main points of the information contained in the text.
- It enables you to present the information more concisely. Writing on a complicated topic can take up several pages, while the same information can be presented in less space by a table or a chart.

These devices enable you make vivid comparisons and show the relations between facts.

They help to summarize data and ideas, and simplify and arrange complicated details so that the reader can easily follow them.

25.3 USING TABLES, CHARTS AND GRAPHS

When you decide to use tables, charts, and graphs, you should keep the following points in mind:

- While planning your entire writing project, keep in mind the tables, charts and graphs, and where you can incorporate them. This will help you in the long run, and give clarity to your thoughts. Therefore, while you are still searching for information, identify concepts and data that will lend themselves to representation through tables, charts, etc.
- Pay special attention to those ideas or data that will present difficulties to your reader. It will be a good idea to present some of the 'difficult' items through tables, charts, etc.
- It is wise to use a fresh illustration each time you need one. The use of ready-made graphs or photographs will not always be so relevant to the point you are making.

25.4 TABLES

A **table** is a 'collection of figures, facts, or other information arranged in columns and rows'. The readers locate the information they need by reading across a row, and up or down a column. So when you design tables your major concern is to provide adequate spacing between columns and rows, so that your readers can find the information easily. You will find that tables are useful for a number of things.

- They can show large numbers of specific data in a brief space. If such data were presented in the text itself, the reader would have to go through a succession of figures occurring in the text.
- Tables eliminate tedious repetition of words, phrases, and sentence patterns that can be put at the tops of columns, or at the side of rows in the table.
- Because a table displays its information in rows and columns, it can be useful for juxtaposing data in two or more dimensions for easy comparison and contrast. Example 1 below tells you what is meant by a *column* and a *row*.

Example 1

INFORMATION CONCERNING FIVE ELEMENTS

	column 1	column 2	column 3	column 4	column 5
	Name of element	Symbol	Atomic weight	Number of protons and neutrons	Melting apont
row 1	lithium	Li	6.94	3p 4n	179°C
row 2	magnesium	Mg	24.312	12p 12n	661°C
row 3	sulphur	S	32.064	16p 16n	112.8°C
row 4	boron	B	10.811	5p 6n	2300°C
row 5	calcium	Ca	40.08	20p 20n	845°C

(A Course in Intermediate Scientific English by Frank Chaplin, Table 2.43)

Tables allow easy comparisons between large numbers of statistics that would be difficult to understand if they appeared in the form of sentences. This is also illustrated effectively by Example 1 above.

Tables can be divided into two broad types: ***dependent*** tables and ***independent*** tables.

A dependent table is an integral part of the text. It needs no title or caption because it is given in continuation of the text. Such a table should contain a small amount of information, probably a maximum of three columns and rows, and a dozen or so numbers. An example of a dependent table is given below.

Example 2

The State Government's contribution of 50% is provided from the State budget into a Fund set up for the purpose known as the FAE (Water Supply & Sewerage Fund). It is a revolving fund inasmuch as the repayments of loans are also credited to the fund for resource generation. Each State Govt. is expected to contribute upto 5% of its revenues from taxation to the FAE subject to a minimum of 2%. When the State Government is unable to fulfil its commitment due to resource constraints, the BNH provides a supplementary line of credit to the State Government to make up the shortfall in contribution to the following extent:

State Contribution	BNH supplementary allocation
3.5 to 4.5%	1%
3 to 3.5%	0.75% to 1%
2 to 3%	0.5% to 0.75%
Below 2%	Nil

Financing Systems & Institutional arrangements for Water Supply and Sanitation in Brazil and Mexico-Report of Study Tour (June 1984), Ministry of Works and Housing, New Delhi

BNH charges 1% interest more than the normal rate for such supplementary contributions.

An independent table may be placed physically within the text but should be clearly distinguished from it. (Example 3 below).

Example 3

Resurgence in Bihar

In 1977, a sample survey conducted by the National Institute of Communicable Diseases (NICD), estimated the number of Kala-azar cases to be 70,000 with 4,500 estimated deaths. However, 16,589 cases and 229 deaths were detected through searches while during 1978 and 1979, 41,953 and 25,172 cases respectively were detected. In the latter year, the figures relate to only those which came to Health Centres/hospitals for treatment, hence the figures are low. The number of cases and deaths recorded due to Kala-azar since 1977 are given in Table 1.

Table 1

NUMBER OF KALA-AZAR CASES AND DEATHS IN BIHAR SIATE

Year	No.of cases	No. of deaths
1977	18589	229
1978	41953	62
1979	25172	28
1980	13820	23
1981	14165	35
1982	11120	35
[illegible]	11832	128
1984	12983	67
1985	12029	37
1986	14029	47
1987	17471	74

From Ka[illegible]ear: Re-emergence of a Dreaded Diseas VHAI

In an independent table, you are inviting your readers to look at the tabular information separately while reading the text. Generally, such tables can present a large amount of information. They require the reader to stop and reflect on the details about the facts and their arrangement. Such a table usually has a table number and a caption. The caption should be carefully written so that you focus the reader's attention on the significant facts presented in the table. Of course, a written summary of the facts presented in the table should also be given, highlighting the important facts.

In some cases a summary of the table is given in the text, and the full table is placed in the appendix.

It will be useful to keep certain points in mind when you prepare tables of your own.

- If you are using several independent tables, you should assign each table a table number. (Look at Example 3 again.). In the text itself, each table should be referred to by the table number rather than by a phrase such as 'the table above . . .' If your text has more than five tables, they should be listed in a separate page after 'Table of Contents', labelled as 'List of Tables'.
- The title of the table can be placed either above or below the table. It should describe in very precise language the contents of the table.
- Each column should have a heading. This heading should be brief but accurate. Units of measurement, if required, are enclosed in brackets beneath the heading. You may use standard abbreviations, if you like. (See Example 1 again.)
- In the left-hand vertical column of the table, we list the items about which information is given in the table.
- The main body of the table comprises the data below each heading in columns to the right of the left vertical column. It is very essential to present the information in the body as clearly as possible. The presentation of information is dependent to a large extent on the way lines are drawn in independent tables. You can have a choice of an open design, a semi-closed design or a closed design. An open design is one which has no vertical or horizontal lines in it (Examples 2 and 3). A semi-closed design has some vertical and/or some horizontal lines. A closed design has both vertical and horizontal lines separating virtually all the items (Example 1).

Check Your Progress 1

1) On the basis of the information given in the following table, answer the questions given below.

DESCRIPTION OF SOME CARS

Make	Price $	Country	Engine Size c.c.	Km./Litre
Mazda	8,400	Japan	898	15
Lada	7,600	U.S.S.R.	972	10
Ford	9.200	U.S.A.	936	14
Honda	8,100	Japan	870	17

a) Which two cars have the most things in common ?

.....

b) Which two cars are very unlike each other ?

.....

c) Which car would be the best value ?

2) Using the statistics given in the following table complete the paragraph below:

	1984	1985	1986	1987	1988
Production (In Tonnes)	1237	1320	1460	1570	1720
Raw Material Consumption (In Tonnes)	1100	1150	1270	1330	1400
Energy Consumption KWH	6370	6200	5875	5625	5370
Modernisation Expenditure Lacs	Nil	3	3	5	2
Gross Profit Lacs	8	15	21	27	32

The table given above illustrates the effect of modernisation on an industry engaged in manufacturing. Over .... (i) .... years, the Company spent ... (ii) ... lacs on its modernisation programme. This .... (iii) .... the energy consumption dramatically. The first row shows a steady increase in ..... (iv) .... , from .... (v) .... tonnes in 1984 to .... (vi) ..... tonnes in 1988. The company's .... (vii) .... also showed a marked increase, from 8 lacs in .... (viii) .... to .... (ix) .... in .... (x) .....

25.5 CHARTS AND GRAPHS

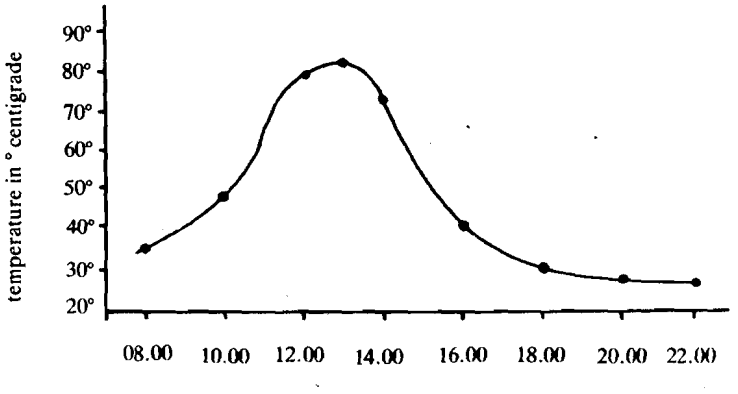
The term chart is used to refer to (i) a detailed map of a sea area, and (ii) information presented in the form of a picture or a graph to make it easily understood. We shall use it here in the latter sense. This presentation through diagrams and graphs can take various forms, including what is known as a flow diagram or a flowchart. These charts simplify the detailed information that is presented and help in its interpretation. Trends, movements, and distributions can be presented in a more comprehensive manner in graphs than in tables.

25.5.1 Line Graphs

A graph is usually a straight or curved line which is drawn between a vertical (that is, an upright) line and a horizontal (that is, a level line) across the page, to connect a series of points representing the varying values of two related things. It, thus, primarily shows the relationship between two sets of figures or two 'variables'. The fixed lines—horizontal and vertical—used as reference points are known as axis, each representing one set of figures or one variable. (See Example 4).

Example 4

Soil surface temperature in
September, in Wadi Halfa, Sudan.

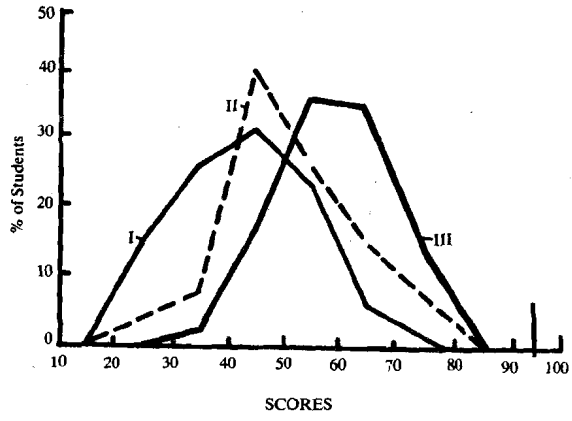


Soil surface temperature in Sept in Wadi Half, Sudan

(A course in Intermediat Scientific English Fig 8.41a)

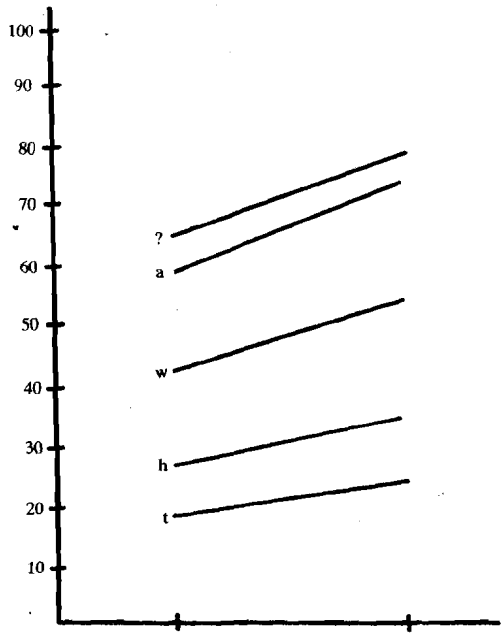
Example 5 below shows the use of a number of lines in the same graph. In preparing such graphs each line has to be given a label. You can emphasize the difference between two lines by shading the space that separates them. In order to differentiate between the different lines, you can use different colours, or a dotted line, a broken line, a semi-broken line, a thick line, a thin line, etc.

Example 5.



(From Testing Communicative Performance by B.J. Carroll)

The question that arises is, how many lines is it possible to accommodate comfortably in a graph ? There can be no single correct answer. For instance, the graph in Example 6 below has five lines in it, and yet it is not too cluttered. Why ? Because the principal objective of presenting that graph is to show that the lines all move in a parallel direction. However, you will realize that if those lines had begun to move across one another, the load of information would be too great for a reader to absorb.



	a	w	?	t	n
Kenyan Asian	58.91	42.73	65.35	18.36	27.14
Indian	74.10	54.31	79.62	24.36	35.80

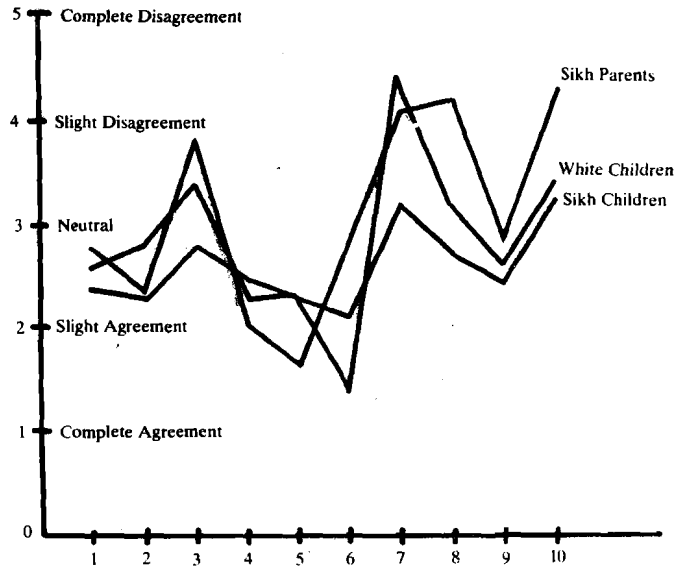
(Iceds Variants by place of orgin)

(From Crisis of Identity by R.K. Agnihotri)

These line graphs are most useful for showing changes that have taken place (or are predicted) over a period of time, as in Example 4. When this is the purpose of the chart, the horizontal scale usually represents a time line, and the vertical scale represents the quantity being measured. In fact a line chart of the type in Example 4 will provide the readers with an immediate picture of general trends.

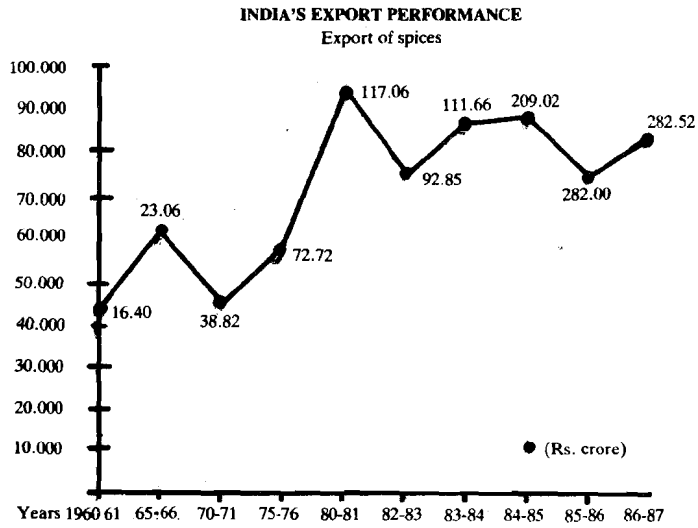
Check Your Progress 2

1) Look at the figure given below. Looking at its appearance, what do you think is wrong with the graph ? How would you improve it ?



Assimilation orientation of the Sikh Children
(Crisis of Identity by R.K. Agnihotri)

2) Look at the following line graph carefully. Then read the statements based on the graph. Indicate whether those statements are true (T) or false (F).



(From Business India May 1.14.1989)

i) Nearly the same amount of spices (in tonnes) was exported in the years '82-'83 and '85-'86.

.....

ii) India's performance regarding the amount of spices (in tonnes) exported peaked in the mid-seventies.

.....

iii) Spices worth more than Rs. 100 crores were exported in the year '83-'84.

.....

iv) The beginning of the seventies saw the export of about 40,000 tonnes of spices.

.....

v) Less than Rs. 60 crores worth of spices were exported in the year '75-'76.

.....

vi) The lowest amount of spices (in tonnes) was exported in '70-'71.

.....

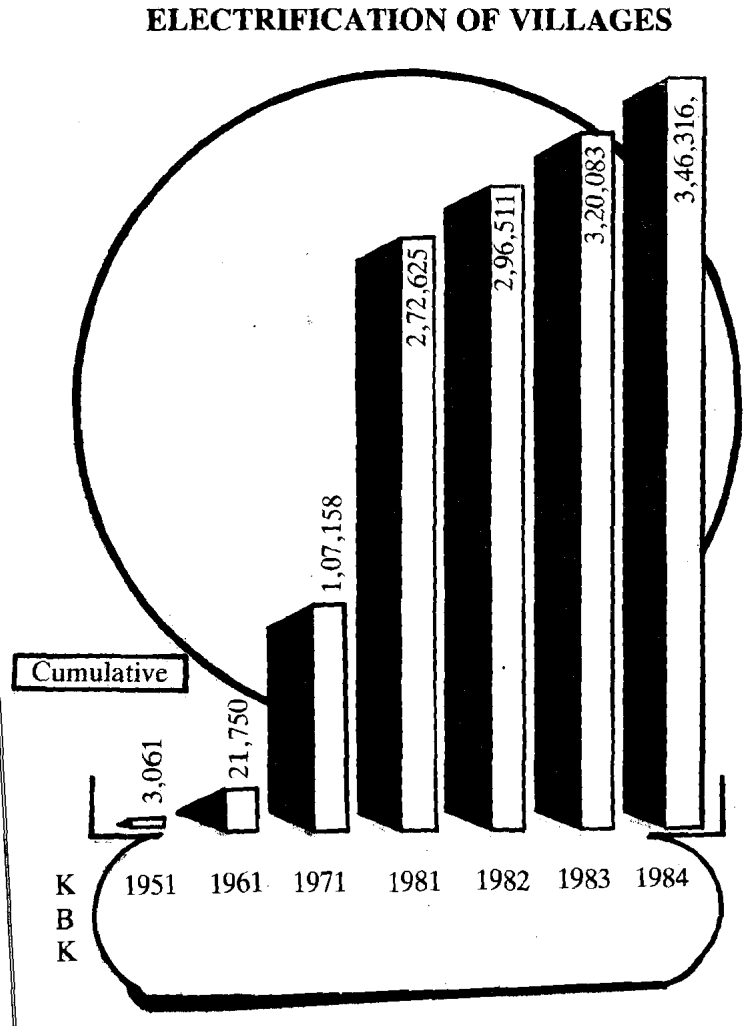
vii) The amount earned through the export of spices showed a decline during the year '82-'83.

.....

25.5.2 Bar Charts

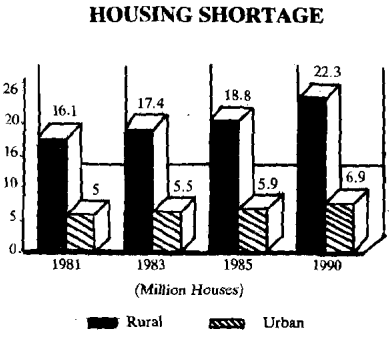
Bar charts consist of a series of horizontal or vertical bars drawn parallel to each other along a scale of measurement. Each bar can represent a different item or the same item at different times, and the scale can be either a scale of percentage or one of absolute quantities. Therefore, bar graphs are useful for showing comparisons between the figures for the same item for different periods of time (Example 7 below) or for different items for the same period of time (Example 8).

Example 7



Indian 1984, Publication Divn. Ministry of Information & Broacasting GOI.

Example 8



(From Business India)

It is helpful for your readers if you label the tops of the bars in your chart. Since it is the top of the bar that interests readers, that is naturally the first place they look at.

Check Your Progress 3

Convert the information contained in the following table into two bar charts. One of the charts should relate to the 'Number of Courses' and 'the Number of Units Prepared'; while the other chart should relate to the 'Number of Audio Programmes Completed', and the 'Number of Video Programmes Completed'. We have done the first one for you as an example.

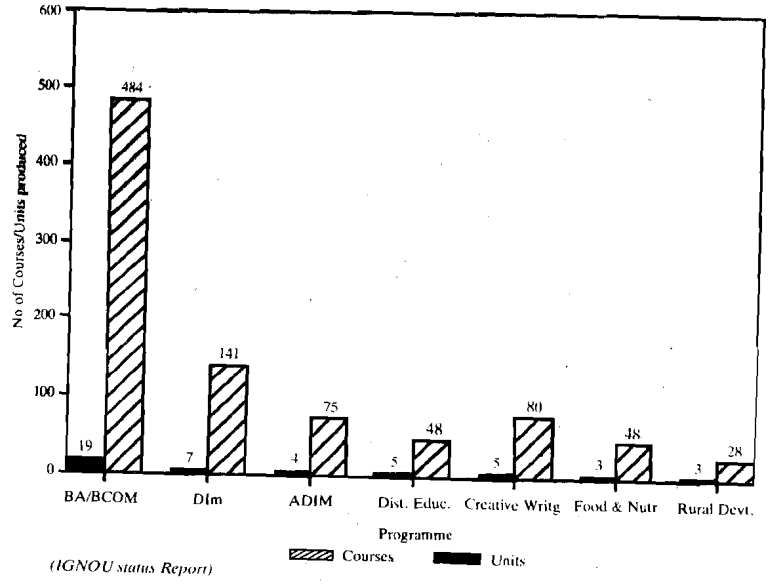
Table 7

ACADEMIC PROGRAMMES
COURSE MATERIAL OUTPUT (AS ON 1-5-89)

S.No	Programme Name	No. of Courses	No. of Units done	No. of Audio Progs	No. of Video Progs.
1.	BA/B.COM	19	484	124	45
2.	Diploma in Managent	7	141	21	41
3.	Advance Diploma in management	4	75	13	12
4.	Diploma in Distanc Educ.	5	48	13	10
5.	Diploma in Creative Writing in English	5	80	10	6
6.	Certificate Prog. in Food & Nutrition	3 + practicals	48	12	13
7.	Certificate Prog. in Rural Devt.	3	28	3	15
8.	Bachelor of Library & Information Science	-	-	6	6
	Total	**56**	**904**	**202**	**148**

(IGNOU status Report)

FIG-17 COURSES & UNITS PRODUCED
(up to 1-5-89)



(IGNOU status Report)

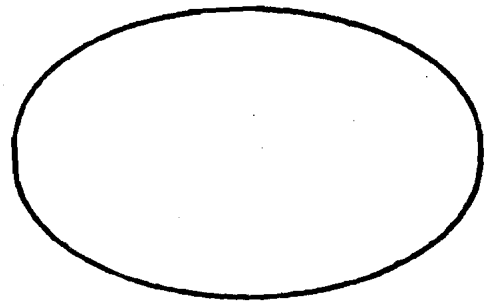
25.5.3 Flow-charts

Not all charts represent quantitative information. For example, you may wish to illustrate the stages of a process, point out locations, give directions, or show

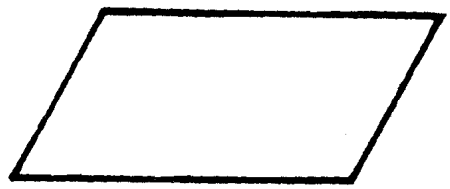
A flow-chart (or flow diagram) is a drawing in which particular shapes and connecting lines are used to show how each particular action in a system is connected with the others.

Flow-charts are an excellent way of illustrating the stages or the steps of a process, or the pathways along which information or the manufacture of components is to travel during specific operations. Flow-charts can show a series of steps that occur in a sequence, or they can show a number of steps or processes that occur simultaneously. They are drawn using a set of conventional symbols that represent various operations. The symbols are connected by arrows to indicate the order in which the activities will occur. We give below a small selection of symbols which will be sufficient to demonstrate their use in flow-charts.

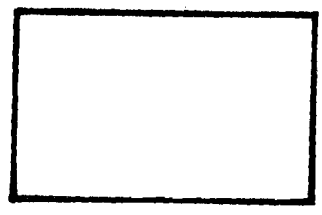
A terminal symbol. It is a symbol used to denote the beginning and end of a flow-chart. Within the symbol you write START, STOP, END.



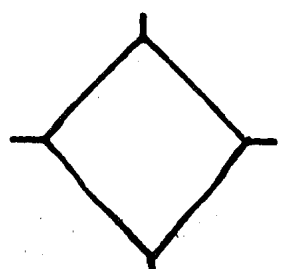
An input symbol. It is used to denote the input that is used to trigger off a decision or a process.



A process symbol. It is used to define the execution of an operation or event. The meaning of the operation or event can be given within the symbol.

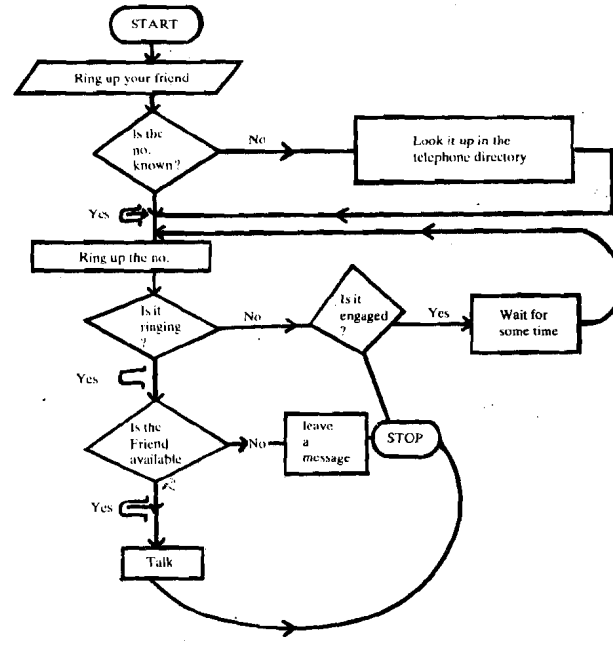


A decision symbol. It is used to ask a specific question, the answer to which should be *yes* or *no*.



Using flow-charts is particularly useful if you wish to simplify your descriptions and provide an easy-to-use visual reference for your readers. For example, a well-designed flow-chart will help you guide your readers through complex descriptions because they present the entire process at once, and thus serve as a guideline to indicate where you are going and how you are getting there. Another important use of flow-charts is that they prevent readers from visualising complex processes on their own, and thus making mistakes.

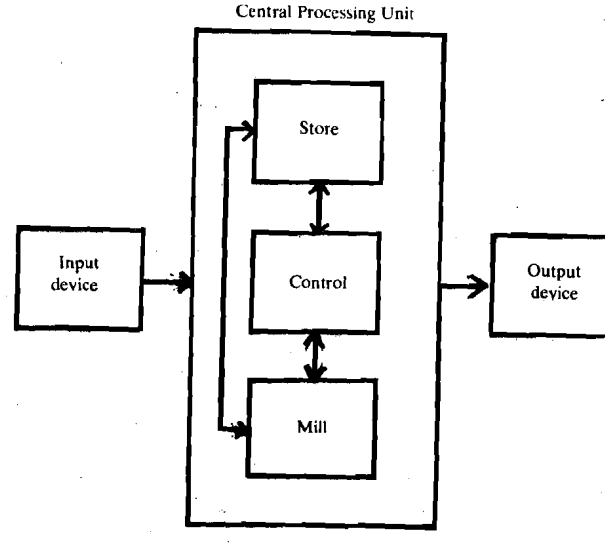
Example 9



(From *Basic Programming* by B.J. Holmes)

The figure shows these five parts in an arrangement which closely resembles the basic anatomy of today's computer. The three parts consisting of the Store, Mill and Control units are collectively known, in current terminology, as the Central Processing Unit (CPU). It is this to which we really refer when talking about the computer. The other two units, the Input and Output devices (I/O), are concerned with entering information (instructions and data) into the CPU, and with outputting the results once processing has taken place.

In order to understand the basis of flow-charts, it is better to begin with simple real-life problems. For instance, you want to ring up a friend and give him/her a message. How would you go about doing so ?



Source: Computer and Commonsense, 3rd Edition, Roger Hunt and John Shelley, Imperial College of Science and Technology, Prentice-Hall of India Private Limited 1985

Check Your Progress 4

Now try this very simple exercise. A man, who is a bachelor, leaves for work every morning. If he leaves by 8.30 a.m., he first has breakfast at Anupam Sweets and then catches a bus to office. If he leaves home later than that, then he skips breakfast and proceeds straight to office. Draw a flow-chart describing his movements.

25.6 LET US SUM UP

In this unit, we made you aware of the communication of information by means of tables, charts and graphs, so that you can interpret them in the text, you read and use them in your own writings.

ANSWERS

Check Your Progress 1

1) a) Mazda and Honda
   b) Lada and Ford
   c) Honda

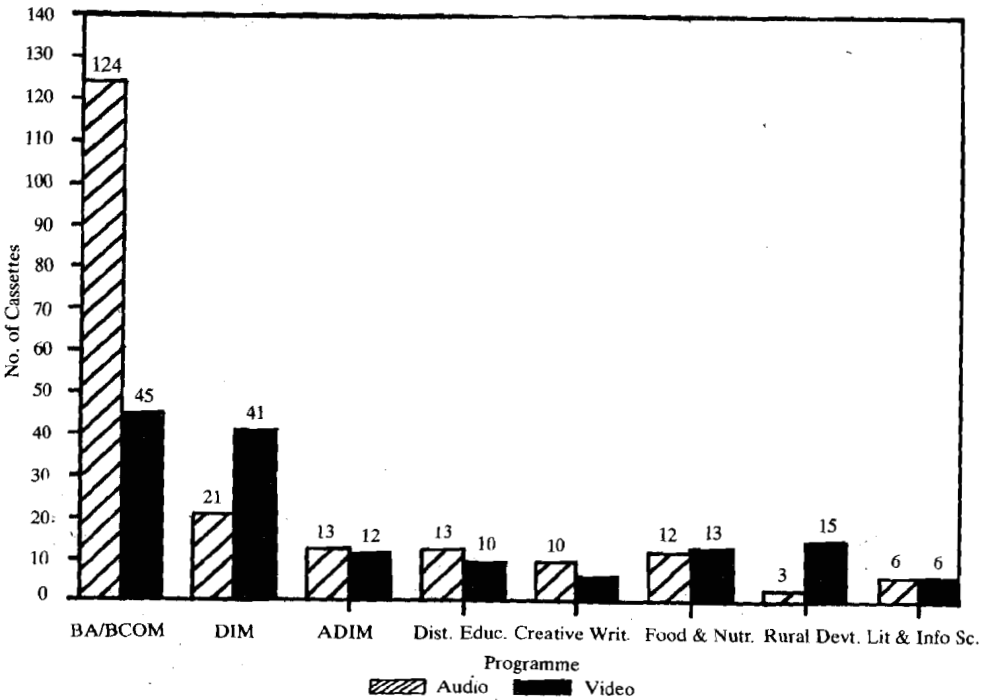
2) i) a period of four
   ii) thirteen
   iii) reduced
   iv) production
   v) 1237
   vi) 1720
   vii) Gross profit
   viii) 1984
   ix) 32 lacs
   x) 1988

Check Your Progress 2

1) The lines have not been differentiated from one another. The graph would improve if a dotted line, a thick line, and a thin line were used.

2) i) T
   ii) F
   iii) T
   iv) T
   v) F
   vi) F
   vii) T

FIG-18 AUDIO/VIDEO PRODUCTION
(up to 1-5-89)



Source: IGNOU Status Report, May 1989, Planning and Development Division Indira Gandhi National Open University

Check Your Progress 4