UNIT 9: SPREADSHEET PACKAGE

UNIT STRUCTURE

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9.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- work with MS Excel, the most popular spreadsheet package
- define Row, Column and Cell in MS Excel
- use cell addressing
- insert and delete Rows and Columns in Excel
- use formulas in a worksheet
- insert charts and display data

9.2 INTRODUCTION

Microsoft Excel is a spreadsheet application developed by Microsoft for Microsoft Windows and Mac operating system. Microsoft Excel has grid of cells arranged in numbered rows and letter-named columns to organize data manipulations like arithmetic operations. It has a collection of functions to answer statistical, engineering and financial needs. In addition, it can

display data as line graphs, histograms and charts, and with a very limited three-dimensional graphical display.

In this unit we will be discussing some of the basic and introductory concepts of Microsoft Excel. Throughout this unit we will be using the Microsoft Office 2010 suite for all the diagrammatic illustrations, examples, and explanation.

9.3 STARTING MS EXCEL

To start using the MS Excel application, we need to have the MS-Office suite installed in our machine.

To start MS Excel we do the following -

1. We first click on the Windows Start button.
2. Then from the Programs menu we select the Microsoft Office suite.
3. This opens the items included in the suite wherefrom we select Microsoft Excel as shown in Figure 9.1 below.

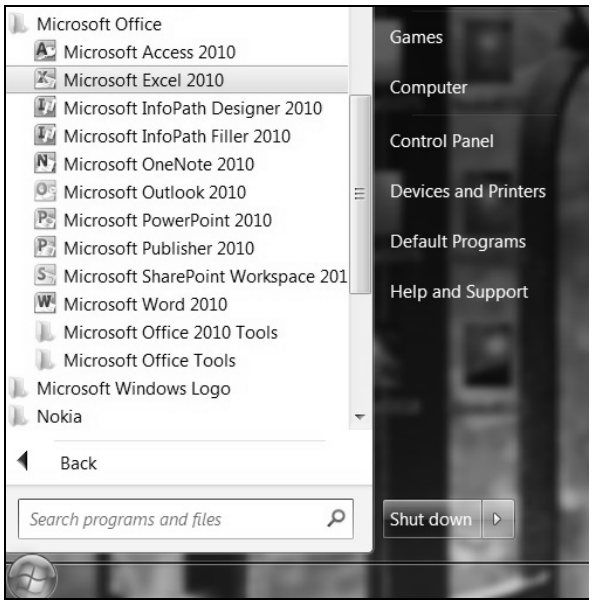


Fig 9.1: Starting MS Excel

9.4 ROW, COLUMN AND CELL

Rows in an Excel sheet are the horizontal lines numbered 1, 2, 3, etc., and Columns are the vertical lines denoted by letters A, B, C, D etc.

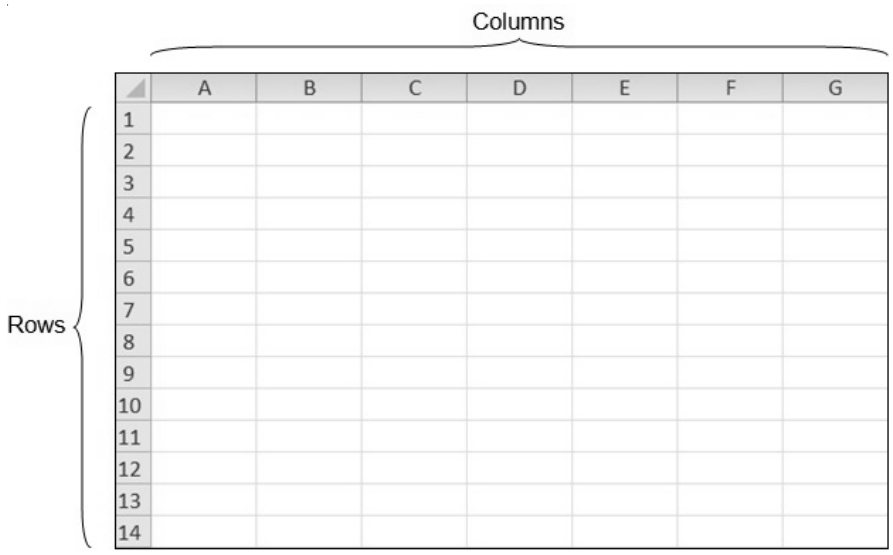


Fig 9.2: Rows and Columns in Excel

The Rows and Columns in an Excel Worksheet are in the form of overlapping horizontal and vertical lines respectively that run through an Excel worksheet. The point of intersection of a Row and a Column is known as a Cell, and thus all cells in an Excel worksheet are formed in this manner. We enter mathematical data into these cells and perform some mathematical operations.

9.5 CREATING, SAVING AND CLOSING A WORKBOOK

A Microsoft Excel workbook is a file which contains one or more worksheets that can be used to organize various kinds of related data. To create a new workbook, one can open a blank workbook. A new workbook can be based on an existing workbook, the default workbook template, or any other template.

Creating a workbook -

To create a new, blank workbook we do the following:

1. We click the **File** tab.
2. Then we click **New**.
3. We then double-click Blank Workbook or select a workbook type and click Create.

To quickly create a new, blank workbook, we can also press **CTRL+N.**

To base a new workbook on an existing workbook we do the following:

1. We click the **File** tab.
2. Then click **New**.
3. Under **Templates**, we click **New from Existing.**
4. In the New from Existing Workbook dialog box, we browse to the drive, folder, or Internet location that contains the workbook which we want to open.
5. Then we click the workbook, and then click **Create New**.

Saving a Workbook -

There are several options in MS Excel that allows us to save a workbook depending on our needs and preferences that define how we plan to use those workbooks in the future.

To save a document for the first time we do the following:

1. On the **Quick Access Toolbar,** we click **Save** , or press **CTRL+S.**
2. We type a name for the document, and then click **Save**.

To save an existing document as a new document, and to prevent overwriting the original document, we do the following:

1. Firstly we open the document that we want to save as a new file.
2. Then we click the **File** tab.
3. Then we click **Save As** which opens the dialogue box of **Figure 9.3.**
4. We type a name for the document, and then click **Save**, which saves the document in a default location. In order to save the document in a different location, we have to click another folder in the **Save** in list in the **Save** As dialog box.

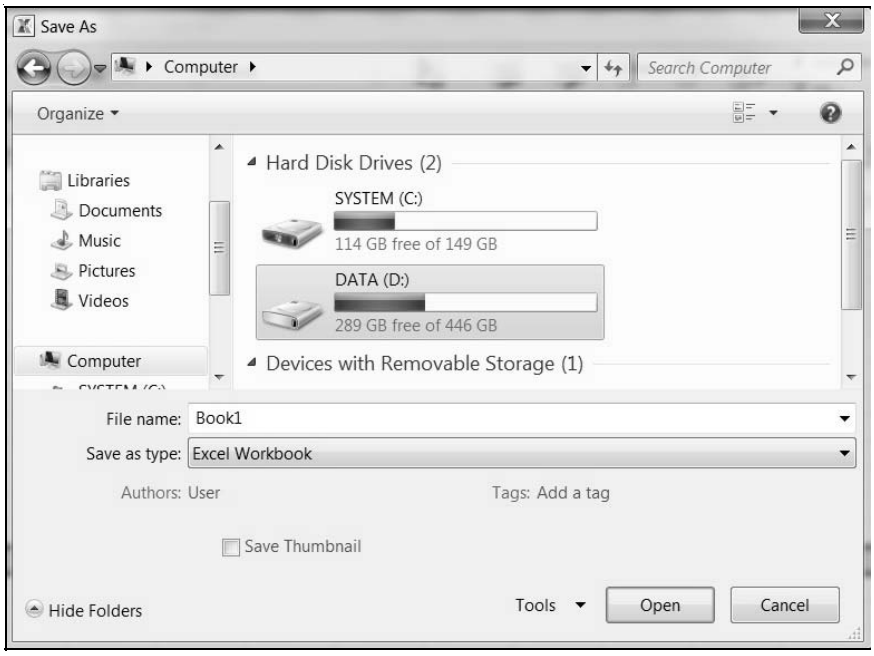


Fig 9.3: The Save As dialog box

Closing a workbook -

Closing an Excel workbook without exiting MS Excel results in closing the current workbook, but not the entire MS Excel application.

To close an Excel workbook we do the following:

1. Firstly we perform any one of the following.
   - We select the File menu and click Close
   - We click the **Close window** button that is located below the **Close** button to quit Excel.
2. If the workbook has been saved previously, it gets closed. Else we are asked to save the current workbook.

9.6 WORKING WITH CELLS

Working with cells in a MS Excel workbook involves inserting data in the cells, inserting and deleting cells and formatting cells. Among these operations, inserting data is as simple as typing. Formatting a cell involves several operations like choosing and applying a cell style, changing the Cell size, etc.

To insert cells we do the following:

1. From the **Cells** group under the **Home** tabs, we click **Insert** and select **Insert Cells** from the drop-down menu.
2. This opens the dialog box of **Figure 9.4** below.
3. We then select any option of the four options and click **OK**.

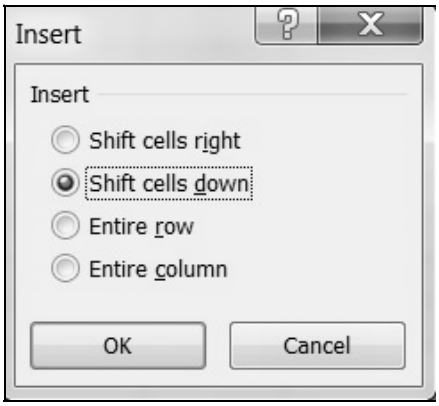


Fig 9.4: The Insert dialog box

To delete cells we do the following:

1. From the **Cells** group under the **Home** tabs, we click **Delete** and select **Delete Cells** from the drop-down menu.
2. This opens the dialog box of **Figure 9.5** below.
3. We then select any option of the four options and click **OK**.

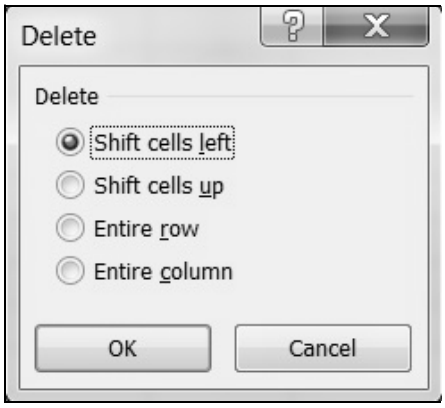


Fig 9.5: The Delete dialog box

To apply a style to a cell we do the following:

1. From the **Styles** group under the **Home** tabs we select **Cell Styles**.
2. From the drop-down list of all the available styles we select the style we want.

To change the size of a Cell we do the following:

1. From the **Cells** group under the **Home** tabs we click **Format** which opens the drop-down menu of **Figure 9.6** below.
2. We can change the **Cell Size** by adjusting the **Row Height** and **Column Width** values.

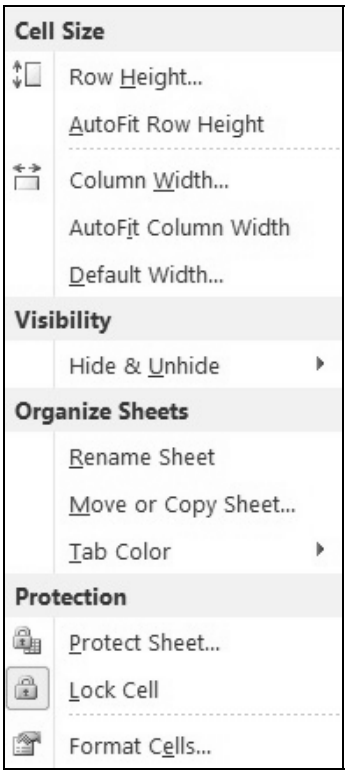


Fig 9.6: Cell formatting options



CHECK YOUR PROGRESS

Q 1: State whether True or False:

(a) We enter mathematical data into Excel cells and perform mathematical operations.

(b) By default, a new workbook contains five worksheets.

(c) Closing an Excel workbook without exiting MS Excel results in closing the current workbook, but not the entire MS Excel application.

(d) Formatting a cell involves choosing and applying a cell style.

(e) We cannot apply a style to an individual cell in Excel.

9.7 MERGING CELLS

Merging cells in MS Excel is the process of combining a group of cells into one single cell. This process involves selecting more than one cell and creating a single cell by combining all of the selected cells by using some cell manipulation features in MS Excel.

To merge cells together we do the following:

1. We first select the cells to be merged.
2. From the **Alignment** group under the **Home** tabs as shown in **Figure 9.7** we click **Merge and Center** which shows the drop-down menu of **Figure 9.8** below.
3. The drop-down menu of **Figure 9.8** has four options -
   - **Merge and Center** merges the selected cells and center-aligns the contents.
   - **Merge Across** merges the selected cells across.
   - **Merge Cells** simply merges the cells keeping intact the previous alignment of the content.
   - unmerges the merged cells into the original layout.

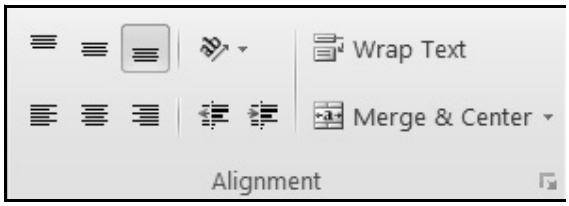


Fig 9.7: The Alignment group

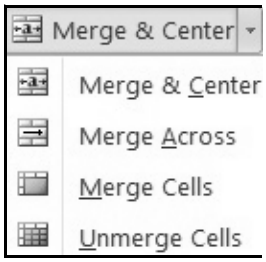


Fig 9.8: The Merge and Center drop-down menu

Cells can also be merged from the Format Cells dialog box by following these steps.

1. We first select the cells to be merged together.
2. Then we follow any one of the following steps to open the **Format**

Cells dialog box of **Figure 9.9** below -

- We may press **CTRL+1**.
- We right-click on the selected cells and select **Format Cells** from the drop-down menu.
- From the **Format** option in the **Cells** group under the **Home** tabs, we select **Format Cells**.

3. From the **Format Cells** dialog box, we select the checkbox for **Merge cells** under the **Alignment tabs** and press **OK**.

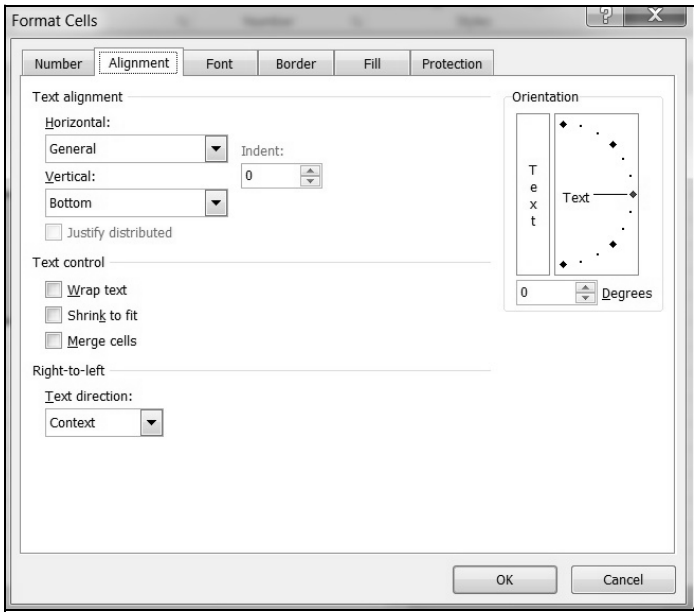


Fig 9.9: The Format Cells dialog box

9.8 INSERTING AND DELETING ROWS AND COLUMNS

Sometimes in an Excel worksheet we may need to insert some additional rows or column or may need to delete them. We can insert rows above a selected row in an Excel worksheet, and columns to the left of a selected column. Likewise we can also delete rows and columns.

To insert Rows/Columns we do the following:

1. We first select the row above which we are to insert a new row, or the column to the left of which we are to insert a new column.
2. Then we click the **Insert** option from the **Cells** group under the Home

tabs as shown in **Figure 9.10** below, which displays the **Insert** drop-down menu of **Figure 9.11**.

3. Then we select the option we want according to whether to insert a row or column.

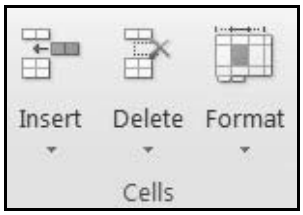


Fig 9.10: The Cells group

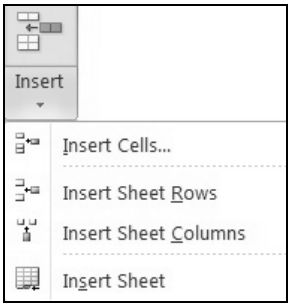


Fig 9.11: The Insert drop-down menu

To delete Rows/Columns we do the following:

1. First we select the Row(s)/Column(s) to be deleted.
2. Then we click the **Delete** option from the **Cells** group under the **Home** tabs as shown in **Figure 9.10** below, which displays the **Delete** drop-down menu of **Figure 9.12** below.
3. Then we select the option we want according to delete either a row or a column.

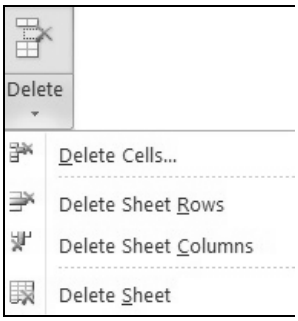


Fig 9.12: The Delete drop-down menu

9.9 WORKING WITH FORMULA AND CHARTS

Formulas -

Formulas in MS Excel are equations that can perform calculations, return information, manipulate the contents of other cells, test conditions, etc. The formula always goes in the cell where we want the formula answer to appear.

Cell Reference:

A cell's location in the spreadsheet is referred to as its cell reference which is a combination of the column letter and row number - such as **A1, B3,** or **Z345**. When writing cell references the column letter always comes first. Therefore, to find a cell reference, we simply look at the column headings to find which column the cell is in, and across to find which row it is in.

Creating Formulas:

When creating formulas in Microsoft Excel, we always start by *typing the **equal sign***. The equal sign informs Excel that what follows is part of a formula, and not just a name or a number. We type it in the cell where we want the answer to appear by combining the cell references of our data with the correct mathematical operator.

The mathematical operators used in Excel formulas are similar to the ones used in mathematics. If more than one operator is used in a formula, there is a specific order that Excel will follow to perform these mathematical operations. This order of operations can be changed by adding brackets to the equation.

How to write formulas:

Writing formulas in a proper way gives us the correct result as the answer. When doing so it is best if we first enter all of our data into the spreadsheet before we begin creating formulas.

Example to ADD two numbers:

Suppose we are to add two numbers located in two different cells

A1 and A2. We choose the cell A5 as the result cell where the formula result has to be displayed. We follow these steps:

1. We enter the two numbers to be added in cells A1 and A2.
2. Then select cell A5 and write any one of the following
   - =SUM(A1,A2)
   - =(A1+A2)
3. Then as we press **ENTER**, the result of addition of the numbers in cells A1 and A2 is displayed in cell A5.

Note: In case we need to add several numbers located in cells A1 through to A10, we simply need to put a semicolon (:) between the first and the last cell-references as =SUM(A1:A10). However this method of including a range of numbers to add using a semicolon works only when we use a function name. Here, SUM is a function name.

There are several formulas in Excel which can be used to perform operations that include numerical, statistical, financial, logical, trigonometric, engineering etc. **Figure 9.13** shows a list of formulas that can be accessed from the **Function Library** group under the **Formula** tabs. Clicking on any function type will list drop-down menus showing a collection of the formulas of the chosen type.

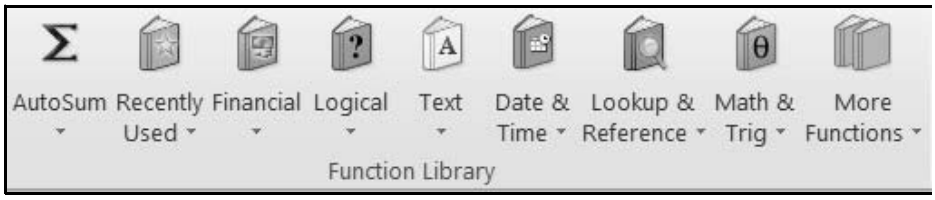


Fig 9.13: The Function Library group

Charts -

Charts are used in Excel to provide graphical representation of numerical data in a way that corresponds to the relationship among the numerical values. When creating a chart or change the type of an existing chart in Microsoft Excel, we can select one of the following chart types.

Column charts:

Data that is arranged in columns or rows on a worksheet can be plotted in a column chart. Column charts are useful for showing data changes over a period of time or for illustrating comparisons among items. In column

charts, categories are typically organized along the horizontal axis and values along the vertical axis.

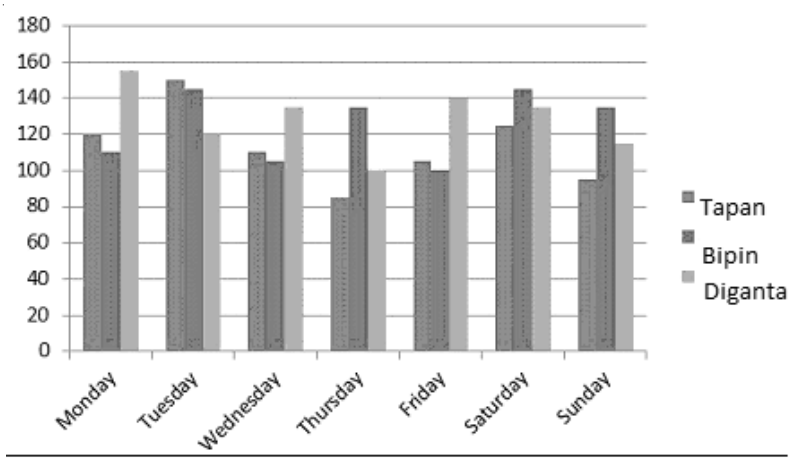


Fig 9.14: A Column chart

Line charts:

Data that is arranged in columns or rows on a worksheet can be plotted in a line chart. Line charts can display continuous data over time, set against a common scale, and are therefore ideal for showing trends in data at equal intervals. In a line chart, category data is distributed evenly along the horizontal axis, and all value data is distributed evenly along the vertical axis.

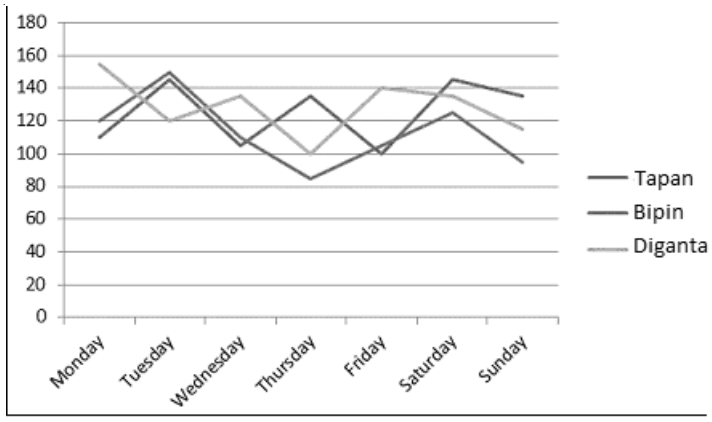


Fig 9.15: A Line chart

Pie charts:

Data that is arranged in one column or row only on a worksheet can be plotted in a pie chart. Pie charts show the size of items in one data series, proportional to the sum of the items. The data points in a pie chart are displayed as a percentage of the whole pie.

We must consider using a pie chart when:

- There is only one data series to plot.
- None of the values to be plotted are negative.
- Almost none of the values that we want to plot are zero values.
- There are not more than seven categories to be plotted.
- The categories represent parts of the whole pie.

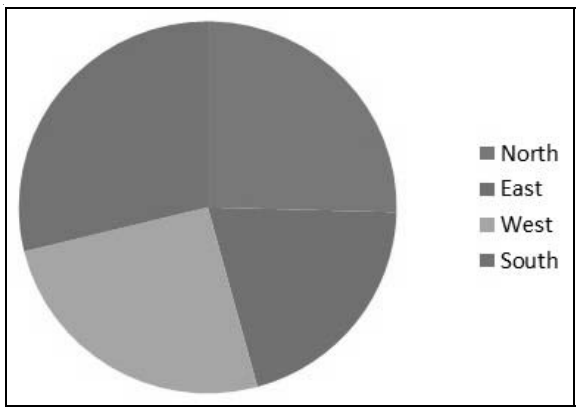


Fig 9.16: A Pie chart

Apart from the above mentioned chart types there are other chart types as well like Area chart, Scatter charts, Stock charts, Surface charts etc which can be used for other different purposes.



CHECK YOUR PROGRESS

Q 2: Fill in the blanks:

(a) ..... cells in Excel involves selecting more than one cell and creating a single cell by combining all of the selected cells.

(b) ..... always go in the cell where we want the formula answer to appear.

(c) A cell's location in the spreadsheet is referred to as its ..... which is a combination of the column ..... and row .....

(d) The ..... used in Excel formulas are similar to the ones used in mathematics.

(e) The ..... sign in an Excel formula informs Excel that what follows is part of a ....., and not just a name or a number.

(f) ..... charts are useful for showing data changes over a period of time or for illustrating comparisons among items.

(g) In column charts, ... are typically organized along the horizontal axis and ..... along the vertical axis.

(h) ..... charts can display continuous data over time, set against a common scale, and are therefore ideal for showing trends in data at ..... intervals.

(i) ..... charts show the size of items in one data series.



9.10 LET US SUM UP

- Microsoft Excel is a ***spreadsheet application*** program.
- A Microsoft Excel ***workbook*** is a file that contains one or more worksheets that can be used to organize various kinds of related data.
- Rows in an Excel sheet are the ***horizontal lines*** numbered 1, 2, 3, etc., and Columns are the ***vertical lines*** denoted by letters A, B, C, D etc.
- The point of intersection of a Row and a Column is known as a ***Cell***.
- ***Merging*** cells in MS Excel is the process of combining a group of cells into one single cell.
- We can ***insert rows*** above a selected row in an Excel worksheet, and ***insert columns*** to the left of a selected column.
- ***Formulas*** in MS Excel are equations that can perform calculations.
- When creating formulas in Microsoft Excel, we always start by typing the ***equal sign***.
- ***Charts*** are used in Excel to provide graphical representation of numerical data.



9.11 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: (a) True b) False c) True d) True e) False

Ans to Q No 2: (a) Merging, (b) Formulas, (c) cell reference, letter, number.

(d) mathematical operators, (e) equal, formula, (f) Column

(g) categories, values, (h) Line, equal, (i) Pie



9.12 FURTHER READING

1. Weixel Suzanne, Wempen Faith, Skintik C, “Learning Microsoft Office 2010”, Standard Student Edition, Pearson
2. Davis G.H. “Beginning Microsoft Office 2010”, Apress publisher.
3. Rutkosky S., “Microsoft Office 2007”, BPB Publication.



9.13 MODEL QUESTIONS

Q 1: What is Microsoft Excel? Describe its use.

Q 2: Explain the process of starting MS Excel, creating, saving and closing a workbook.

Q 3: How do we insert and delete cells in Excel?

Q 4: Explain how rows and columns can be inserted and deleted in an Excel worksheet.

Q 5: How can we merge cells in MS Excel?

Q 6: What are Formulas in MS Excel? Illustrate their use using an example.

Q 7: What are charts in MS Excel? Mention any two chart types along with their use.

Q 8: What are Area charts in MS Excel? Give an example.

Q 9: Illustrate the use of Line charts using some sample data.

Q 10: Create a pie chart using the following data.

Ice-cream flavors	Price in Rupees
Candy	35
Strawberry	25
Apple	55
Orange	45
Mango	50

*** ***** ***