CHAPTER 10

SPREADSHEET PROCESSING

Q1. What is a Spreadsheet? Discuss its features.

SPREADSHEET:

- A spreadsheet, also known as a worksheet, contains rows and columns and is used to record and compare numerical or financial data.
- Spreadsheets only existed in paper format, but now they are most likely created and maintained through a software program that displays the numerical information in rows and columns.
- Spreadsheets can be used in any area or field that works with numbers and are commonly found in the accounting, budgeting, sales forecasting, financial analysis, and scientific fields.
- Computerized spreadsheets mimic a paper spreadsheet.
- The advantage of using computerized spreadsheets is their ability to update data and perform automatic calculations extremely quickly.
- On a computerized spreadsheet, the intersection of a row and a column is called a cell.
- Rows are generally identified by numbers 1, 2, 3, and so on.
- Columns are identified by letters, such as A, B, C, and so on.
- The cell is a combination of a letter and a number to identify a particular location within the spreadsheet, for example A3.
- To maneuver around the spreadsheet, you use the mouse or the tab key.
- When the contents of one cell are changed, any other affected cell is automatically recalculated according to the formulas in use.

- Formulas are the calculations to be performed on the data.
- Formulas can be simple, such as sum or average, or they can be very complex.
- Spreadsheets are also popular for testing hypothetical scenarios.

FEATURES OF SPREADSHEET SOFTWARE:

All the spreadsheet software has different features, but some of the basic features of spreadsheet software are mentioned below.

Grid of Rows and Columns

- A spreadsheet is a collection of rows and columns and made a grid like structure.
- Columns are assigned character as their name and rows are assigned numbers as their name to refer them.
- The column and row combines to form a cell address e.g. A12 represent column A and row 12. It is also called the **cell label** or **address**.
- Cell contains data e.g. text, numeric, a formula and a date, that is called **cell value**.

Formulas

- Formula is a combination of operands and operators. Here operands can be cell references and values.

Functions

- Functions are built in formulas.
- You can give direct value or cell reference to the function for calculations.

Commands

- Commands are used to perform operations on the worksheet or its contents.

Text Manipulation

- You can perform some simple text manipulations e.g. combine the textual data of two cells into a single cell.

Print

- This facility allows you to print your spreadsheet on a printer to get a hard copy.

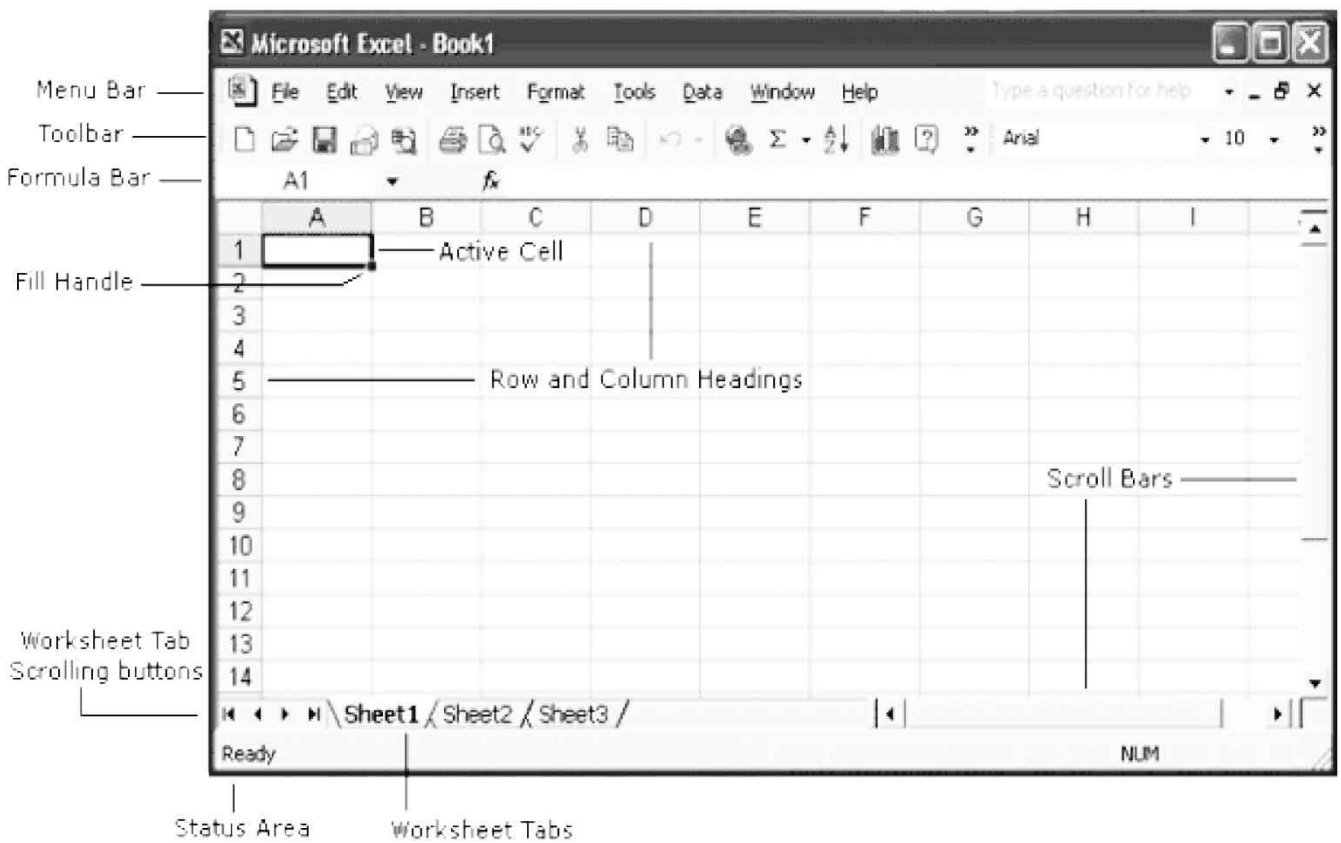
Q2. What is an Interface? Discuss the Interface of Spreadsheet.

STARTING SPREADSHEET:

- To have a better understanding with a spreadsheet you should be familiar with its **interface**.
- Interface represents a way through which you can interact with the Spreadsheet software.

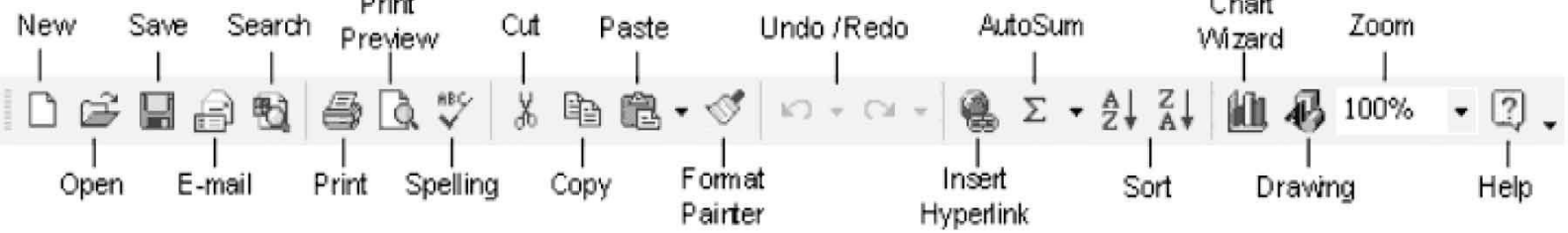
THE SPREADSHEET'S INTERFACE:

- Spreadsheet's interface consists of a grid like structure (word area) and a set of various tools to perform different operations.
- A grid like structure is called a **worksheet**.
- More than one worksheet combined to form a **workbook**.
- In early days there were only one worksheet in a document but now there can be more than one worksheet to form **3D-Worksheets**.
- It s like a pad of worksheets.
- It is due to this that data in one worksheet can be used in another worksheet of the same workbook.
- Spreadsheet interface also contain menu bars, toolbars, and a formula bar.
- Formula bar is used to write certain formulas.



Standard Toolbar

- The Standard toolbar, located beneath the menu bar, has buttons for commonly performed tasks like adding a column of numbers, printing, sorting, and other operations.
- Excel let's you customize the toolbar or even display multiple toolbars at the same time.
- The Standard Excel toolbar appears in the figure below.


New
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Print
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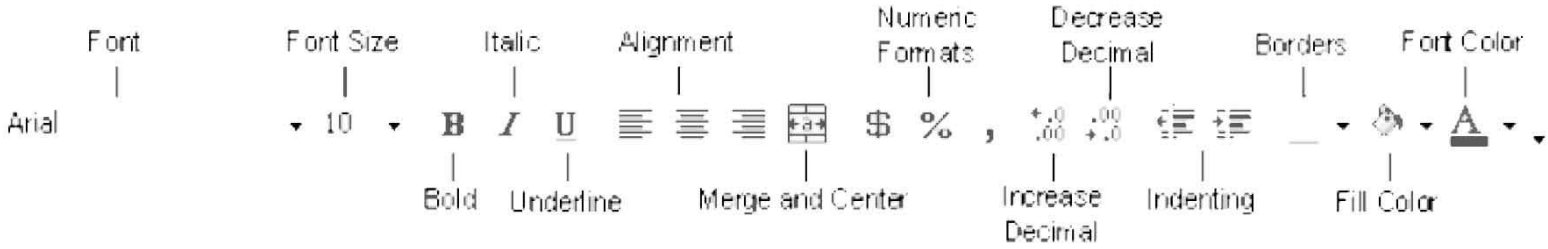
Copy
Format Painter
Insert Hyperlink
Sort
Drawing
Help

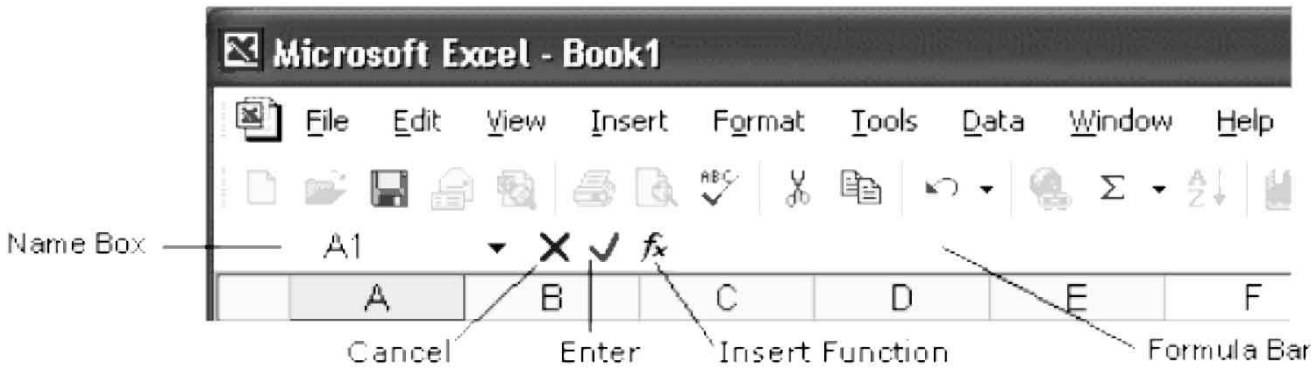
Formatting toolbar

- The Formatting toolbar, located beneath the Standard toolbar bar, has buttons for various formatting operations like changing text size or style, formatting numbers and placing borders around cells.



Formula bar

- The formula bar is located beneath the toolbar at the top of the Excel worksheet.
- Use the formula bar to enter and edit worksheet data.
- The contents of the active cell always appear in the formula bar.
- When you click the mouse in the formula bar, an X and a check mark appear.
- You can click the check icon to confirm and completes editing, or the X to abandon editing.



Name box

- The Name box displays the reference of the selected cells.

Q3. What is the procedure to enter data in a Worksheet? Discuss basics of a Worksheet.

ENTERING DATA IN A WORKSHEET

- The place where data is entered in spreadsheet is called cell.
- You can enter data in the form of text, numbers, formulas, functions and dates.
- The cell can also hold videos, images, sound files etc.
- There are two states of a cell.
- **Active cell** When a cell has control on it, it is called active cell. Control is showed with a rectangular frame on the cell.

- **Passive cell** The cell without rectangular frame is called passive cells.
- To enter data into a cell it must be active.
- Now just start to write whatever you wants to enter in the cell. You can also edit the contents of a cell. For this just make that cell active and change it into edit mode.
- To change a cell into edit mode simply double click on it by using mouse or press F2 key from the keyboard.
- Like other application software spreadsheets also provide the facility of **cut**, **copy** and **paste**.

BASICS OF WORKSHEET

- Data in a worksheet can have many different forms but the most common forms of data in a cell are as follows.
- **Labels**

  Labels are used to identify a value or series of values e.g. "Marks" can represents a column having marks of students. Label should be short and self explanatory. No mathematical operation can be applied on labels.
- **Values**

  Values are numeric data entered in a cell. These values can be whole numbers, decimals, negative numbers, currency and other types of values including scientific notations.
- **Formulas**

  It is the most powerful feature of spreadsheet. Formula can produce results on the basis of values. More complex formulas can evaluate logical condition and perform certain calculations on the basis of their results. All logical condition are evaluated to either true or false.

Difference between Labels and Values

Values	Labels
A value can be numeric constant, date, a formula or a formula's result.	Label is a text entry such as "Marks", or "Name" etc.
Mathematical calculations can be performed on values.	No mathematical operation can be performed on labels.

Cell References

- Reference identifies a cell or a range of cells on a worksheet and tells Microsoft Excel where to look for the values or data you want to use in a formula.
- With references, you can use data contained in different parts of a worksheet in one

formula or use the value from one cell in several formulas.

- You can also refer to cells on other sheets in the same workbook, and to other workbooks.
- References to cells in other workbooks are called links.
- By default, Excel uses the **A1** reference style, which refers to columns with letters (**A** through **IV**, for a total of **256** columns) and refers to rows with numbers (**1** through **65536**).
- These letters and numbers are called row and column headings.
- To refer to a cell, enter the column letter followed by the row number. For example, **B2** refers to the cell at the intersection of column **B** and row **2**.

Cell Ranges

- A collection of cells is called a cell range.
- Cell ranges are used in functions.
- It is useful when you want to add many cells. For example if you want to add cells from A1 to **A123**.
- It is very difficult and tiresome to write formula for this but we can easily use this range in a function to calculate the sum e.g. **=SUM(A1:A123)**

Named Ranges

- Named Ranges are a powerful tool in Excel that allows you to assign a meaningful name to a single cell or a range of cells.
- For example, you can assign the name "**TaxRate**" to cell **C1** and then use the name "**TaxRate**" anytime you would normally use the cell **C1**, such as **=A5*TaxRate**.
- There are 3 advantages to using Named Ranges:
- Formulas are more readable and meaningful. A formula like **=A5*TaxRate** is more meaningful to you when you are working with a complex worksheet.
- Named Ranges, by default, always use absolute cell references. Therefore, you don't have to worry about address translation, which occurs with relative cell references, when you Copy/Paste or Fill Down/Right cell ranges.
- Named Ranges make it easier to create well organized and attractive workbooks. You can use a named reference, rather than a cell address, in formulas, and then define that name to a specific cell after you've designed the workbook. With Named Ranges, you won't have to edit and change the dependent formulas. Just change the reference of the name.

Valid Range Names

- A range name can contain letters, numbers, and underscores, but not spaces or special punctuation characters. Moreover, it cannot be the same as a normal cell reference.

For example, "**AA10**" is not a valid range name because "**AA10**" is the name of a normal cell reference (row **10**, column "**AA**").

Adding and Deleting Named Ranges

- To create a new Named Range from Excel, use the following procedure:
- Select the cell or range of cell that you want to assign a name to.
- Go to the **Insert** menu, select **define** from **Name** menu item, and type your name in the text box.
- To delete a named range, go to the **Insert** menu, select the **Name** menu item, then select the **name** from this list, and click the Delete button.

Q4. What is relative and absolute referencing? What is the procedure of linking worksheets?

RELATIVE REFERENCING

- A relative cell reference in a formula, such as **A1**, is based on the relative position of the cell that contains the formula and the cell the reference refers to.
- If the position of the cell that contains the formula changes, the reference is changed.
- If you copy the formula across rows or down columns, the reference automatically adjusts. By default, new formulas use relative references. For example, if you copy a relative reference in cell **B2** to cell **B3**, it automatically adjusts from **=A1** to **=A2**.

ABSOLUTE REFERENCING

- An absolute cell reference in a formula, such as **A1**, always refer to a cell in a specific location.
- If the position of the cell that contains the formula changes, the absolute reference remains the same.
- If you copy the formula across rows or down columns, the absolute reference does not adjust.
- By default, new formulas use relative references, and you need to switch them to absolute references. For example, if you copy a absolute reference in cell **B2** to cell **B3**, it stays the same in both cells **=A1**.

LINKING WORKSHEETS

- You may want to use the value from a cell in another worksheet within the same workbook in a formula.
- For example, the value of cell **A1** in the current worksheet and cell **A2** in the second worksheet can be added using the format "**sheetname!celladdress**".

- The formula for this example would be "**=A1+Sheet2!A2**" where the value of cell **A1** in the current worksheet is added to the value of cell **A2** in the worksheet named "**Sheet2**".

Q5. What is formula? Write down the procedure to apply formula in worksheets.

FORMULA:

- A formula is a mathematical expression that uses numbers, cell references or both.
- Formulae enable you to perform calculations by using values in the worksheet.
- When you use a formula to create a calculation, and you change any of the values referenced by the formula, Excel automatically recalculates the result.
- You can enter formulae in two ways: type the formula directly in the cell, or point to the cells that you want the formula to compute.
- Following are arithmetic operators that you can use in formulae.

Operator	Description
+	Addition
-	Subtraction
*	Multiplication
/	Division
%	Percentage
^	Exponentiation

Example:

Write **=5+7** in a cell and press **Enter**. It will display **12** as a result in the cell. You can use different operator for different formulas. You can also use cell references instead of constant values to calculate formulas.

Q6. What is a function? Write down the procedure to apply functions in worksheets.

FUNCTIONS

- Functions are predefined formulas that perform calculations by using specific values, called arguments, in a particular order, or structure.
- Functions can be used to perform simple or complex calculations. For example, the **ROUND** function rounds off a number in cell **A10**.

- Functions can be a more efficient way of performing mathematical operations than formulas.
- For example, if you wanted to add the values of cells **A1** through **A5**, you would type the formula "**=A1+A2+A3+A4+A5** ". A shorter way would be to use the **SUM** function and simply type "**=SUM(A1:A5)**".

STRUCTURE OF A FUNCTION

- The structure of a function begins with an equal sign (=), followed by the function name, an opening parenthesis, the arguments for the function separated by commas, and a closing parenthesis.
- Function name: For a list of available functions, click a cell and press **SHIFT+F3**.
- Arguments: Arguments can be numbers, text, logical values such as TRUE or FALSE, error values such as **#N/A**, or **cell references**. The argument you designate must produce a valid value for that argument. Arguments can also be constants, formulas, or other functions.
- Some examples of commonly used functions are given below.

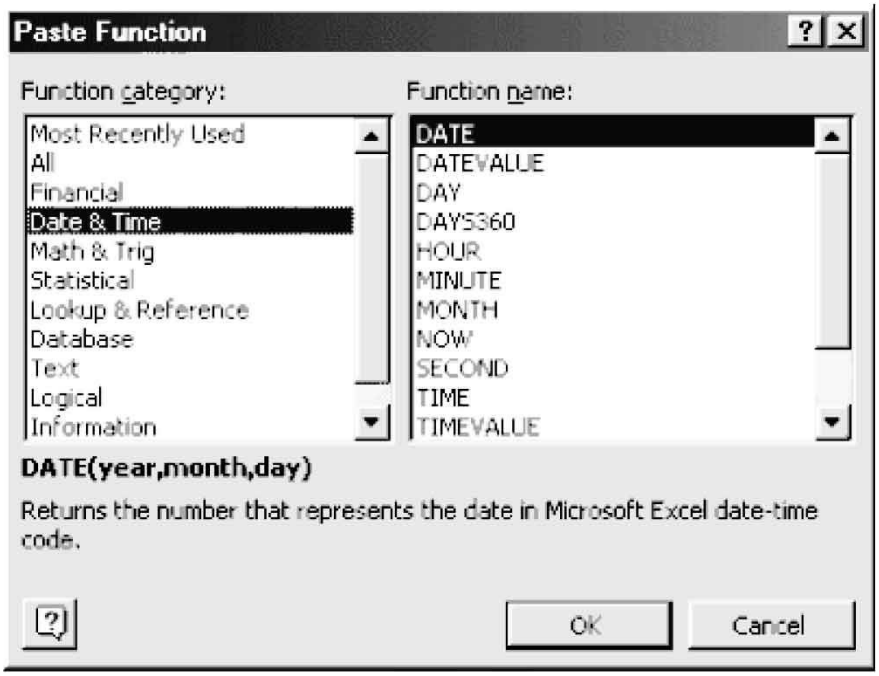
Function	Example	Description
SUM	=SUM(B1:B50)	finds the sum of cells B1 through B50
AVERAGE	=AVERAGE(F1:F20)	finds the average of cells F1 through F20
MAX	=MAX(D1:D500)	returns the highest number from cells D1 through D500
MIN	=MIN(D1:D500)	returns the lowest number from cells D1 through D500
SQRT	=SQRT(A10)	finds the square root of the value in cell A10
TODAY	=TODAY()	returns the current date (leave the parentheses empty)

FUNCTION WIZARD

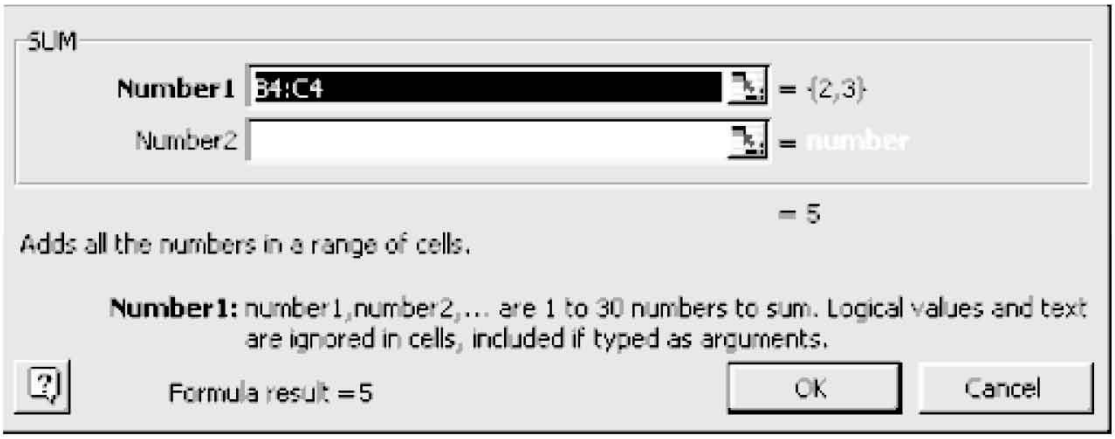
- View all functions available in Excel by using the Function Wizard.

- Activate the cell where the function will be placed and click the **Function Wizard** button on the standard toolbar.

- From the **Paste Function** dialog box, browse through the functions by clicking in the **Function category** menu on the left and select the function from the **Function name** choices on the right. As each function name is highlighted a description and example of use is provided below the two boxes.



- Click **OK** to select a function.
- The next window allows you to choose the cells that will be included in the function. In the example below, cells **B4** and **C4** were automatically selected for the sum function by Excel. The cell values **{2, 3}** are located to the right of the **Number 1** field where the cell addresses are listed. If another set of cells, such as **B5** and **C5**, needed to be added to the function, those cells would be added in the format "**B5:C5**" to the **Number 2** field.



  - Click **OK** when all the cells for the function have been selected.

Difference between Formula and Function

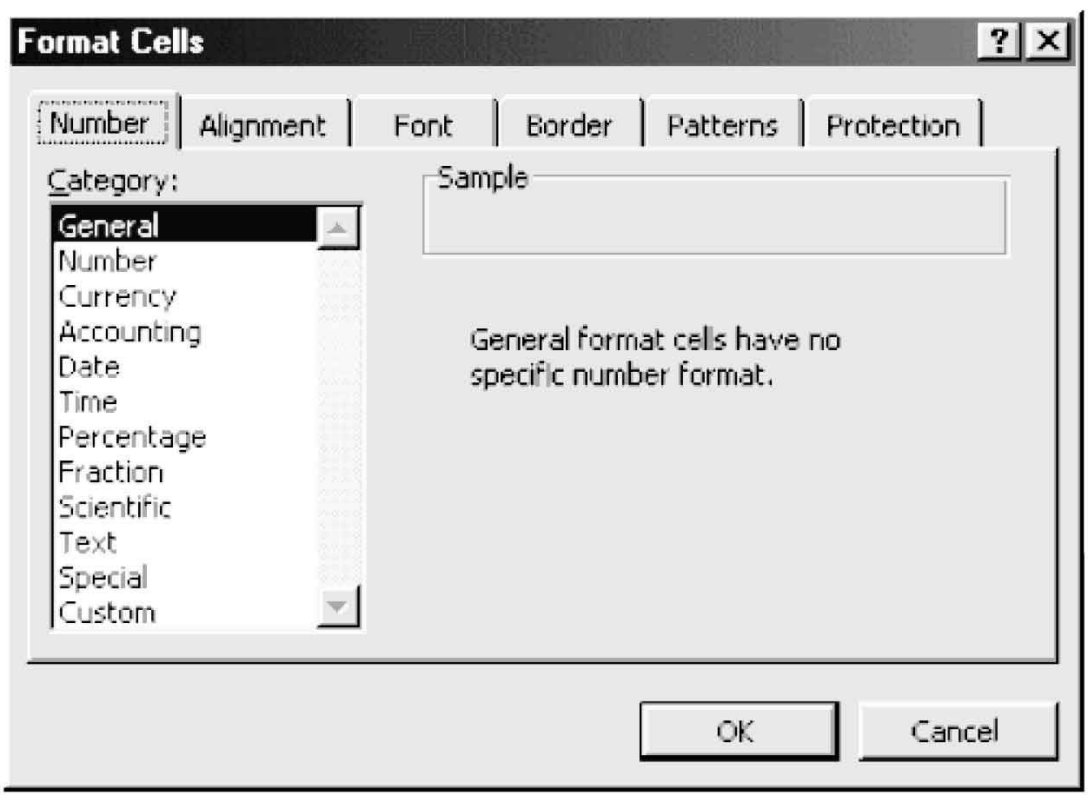
Formulas	Functions
They are created by the users	These are built in programs.

They can perform function as required by the user.	They can only perform the predefined functions.
A formula has no name.	Function has a unique name.
No parameter is passed to the formula.	Certain arguments are passed to the function.
Formula is a difficult way to perform calculations.	It provides easy and efficient process to perform calculations.

Q7. What is Cell Formatting? Write down the procedure to apply formatting in worksheets.

CELL FORMATTING

- To enhance the appearance and to improve readability of your worksheets, you can format the information in worksheet cells either before or after you enter the data.
- You can change the fonts or apply attributes such as boldface, italic, underline, borders, patterns, and colors.
- You also can apply numeric and date and time formats.
- Many of the formats you will use most often are accessible on the Formatting toolbar. Additional formatting options are available on the Format menu.
- You will get the following Format dialog box



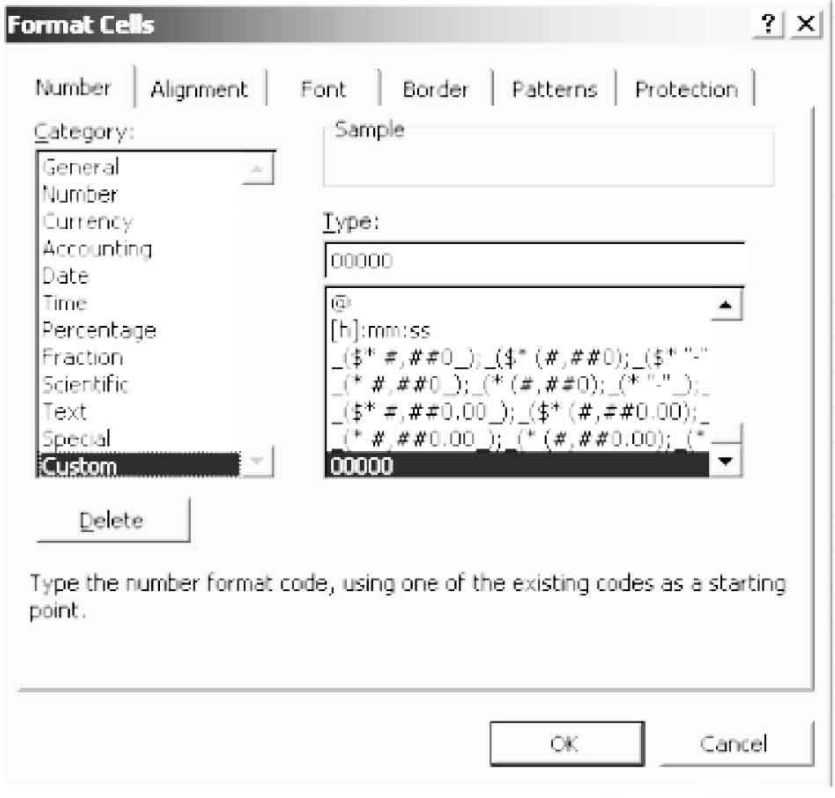
CREATING CUSTOM FORMAT

- You can create your own custom numeric formats for financial or scientific tasks and create formats for catalog numbers, international currency, and so on.

- Any time you need to display a number in a special way, you should consider using a custom numeric format.
- Each number format consists of four parts.
- First part describes the positive numbers, the second describe the negative numbers third describe zero values and the fourth describe text values.
- Each part is separated by semicolon.
- These parts of format are optional.
- If you specify two the first will be used for positive numbers and zero values and the second is used for negative numbers.
- If you specify only one, all numbers use the same format and text value use general format.

Symbols used in Custom Format

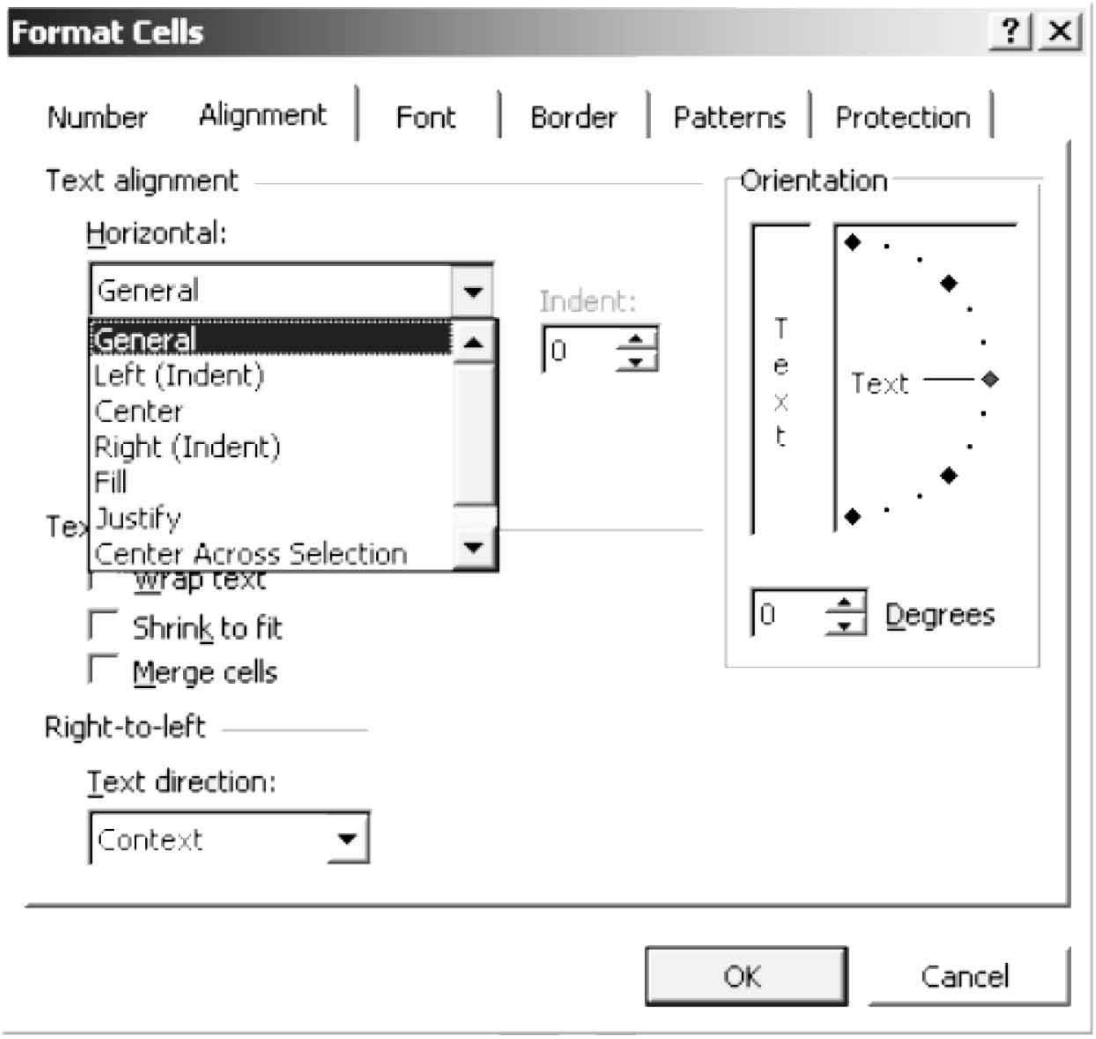
Symbol	Meaning	Example
#	Using # insignificant zeros will not display.	If custom format is #,### then 4500 will be displayed as 4,500
. (Period)	It indicated that how many digits appear to the right of a decimal pint. The cell display will round to the number of placeholders to the right of the decimal pint in the format.	If the custom format is ###.00 then 2.3 will be displayed as 2.30 and 658 will be displayed as 658.00
0	It determines that how many digits will display on either side of a decimal number.	If custom format is 000 then 7 will be displayed as 007 and 70 will be displayed as 070.
?	A space holder similar to 0 character, except that space is left for insignificant zero character on either side of a decimal pint.	If custom format is 0.??? Then for 34.876 and 5.6, if displayed vertically the decimal pint of 34.876 will become under the decimal point of 2.4



- The format you select for the cell will change the contents of cell according to that format.
- There are separate formats for different data values like currency, date etc.

ALIGNING CELL CONTENTS

- Excel automatically aligns entries within a cell, according to the data you enter.
- When you enter text in a cell, Excel aligns the data to the left of the cell.
- When you enter numbers, Excel aligns them to the right.
- You can override this automatic alignment, and specify how you want data aligned: to the **left**, to the **right**, **centered**, **justified** or **Fill**.
- In most cases, you will probably want to change the alignment of column headings so that the text is centered in each cell.
- If your worksheet data includes a title, you may also want to center the title over the worksheet data.



MERGE CELL AND WRAP TEXT

- **Merge cell** option combines two or ore selected cells into a single cell.
- The cell reference for a merged cell is the upper left cell in the original selected range.
- **Wrap text** option wraps text into multiple lines in a cell.
- The number of wrapped lines is dependent on the width of the column and the length of the cell contents.
- These two options can be applied by following these steps
- Selecting cell or range of cells.
- From **format** menu select cells **format cells** option.
- A dialog box will appear, from this dialog box select **alignment** tab.
- Here select the required option and press **ok** button.

Q8. What is a Chart? Write down the procedure to Create Charts in worksheets.

INTRODUCING CHARTS

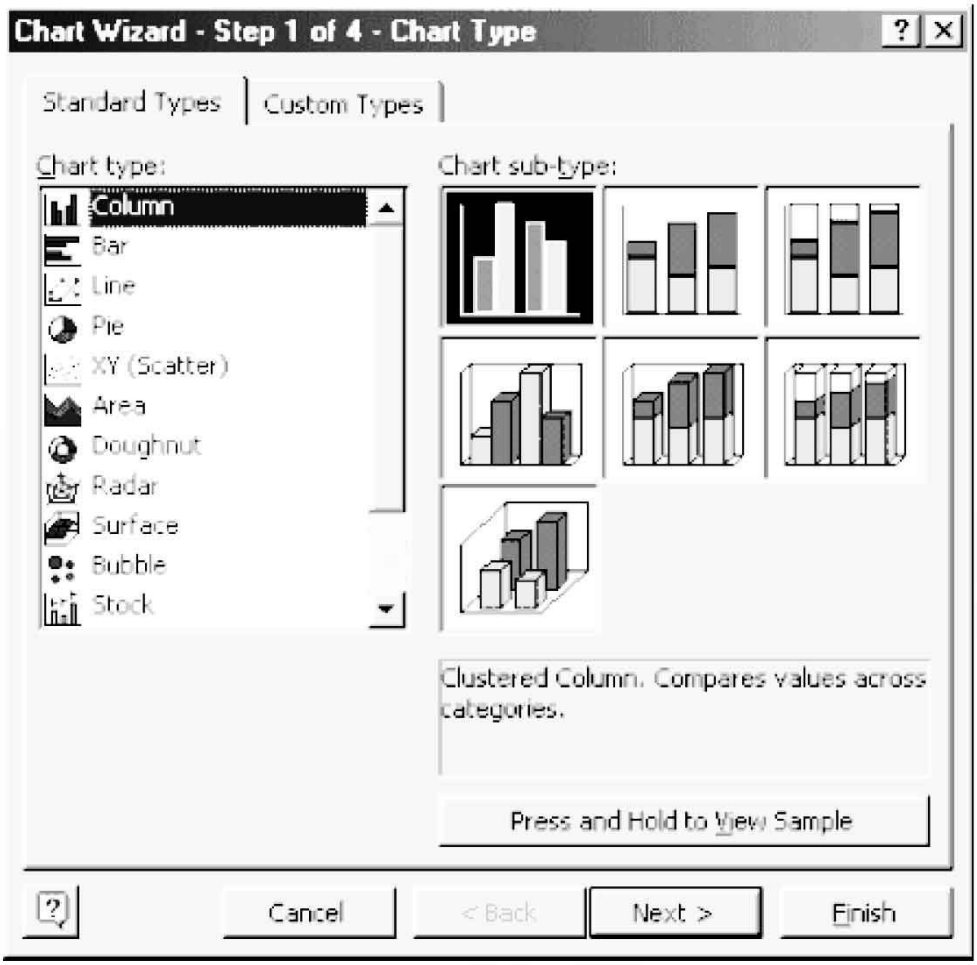
- Charts are visually appealing and make it easy for users to see comparisons, patterns, and trends in data.
- For instance, rather than having to analyze several columns of worksheet numbers, you can see at a glance whether sales are falling or rising over quarterly periods, or how the actual sales compare to the projected sales.

CHART WIZARD

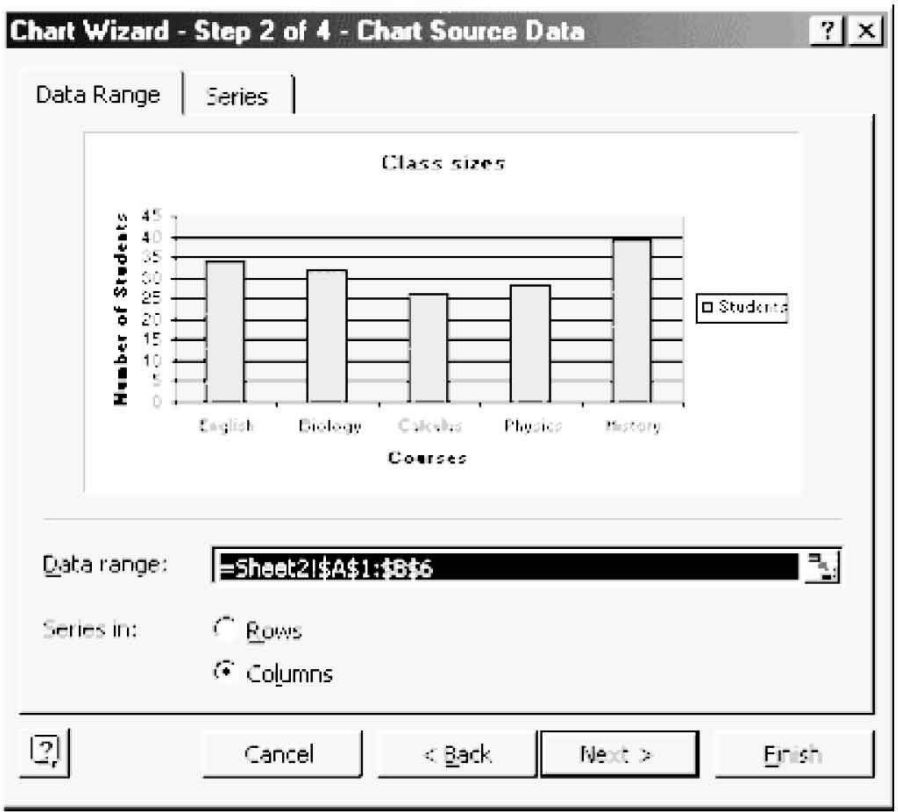
- The Chart Wizard brings you through the process of creating a chart by displaying a series of dialog boxes.
- Enter the data into the worksheet and highlight all the cells that will be included in the chart including headers.

	A	B	C
1		Students	
2	English	34	
3	Biology	32	
4	Calculus	26	
5	Physics	28	
6	History	39	
7			

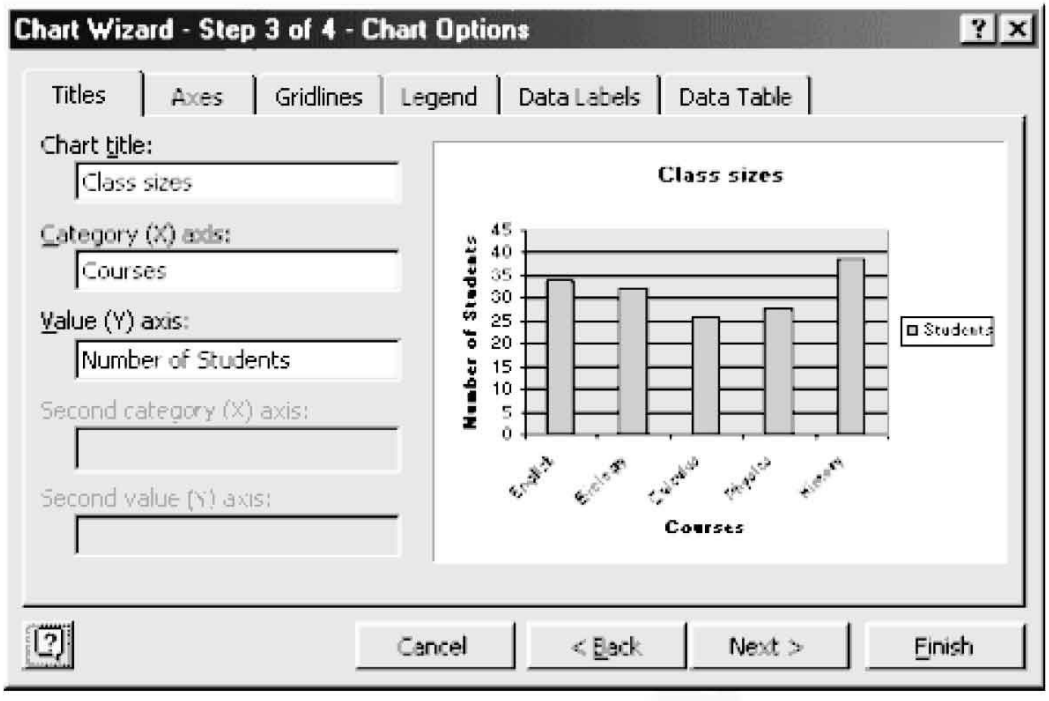
- Click the Chart Wizard button on the standard toolbar to view the first **Chart Wizard** dialog box.
- **Chart Type:** Choose the Chart type and the **Chart subtype** if necessary. Click **Next**.



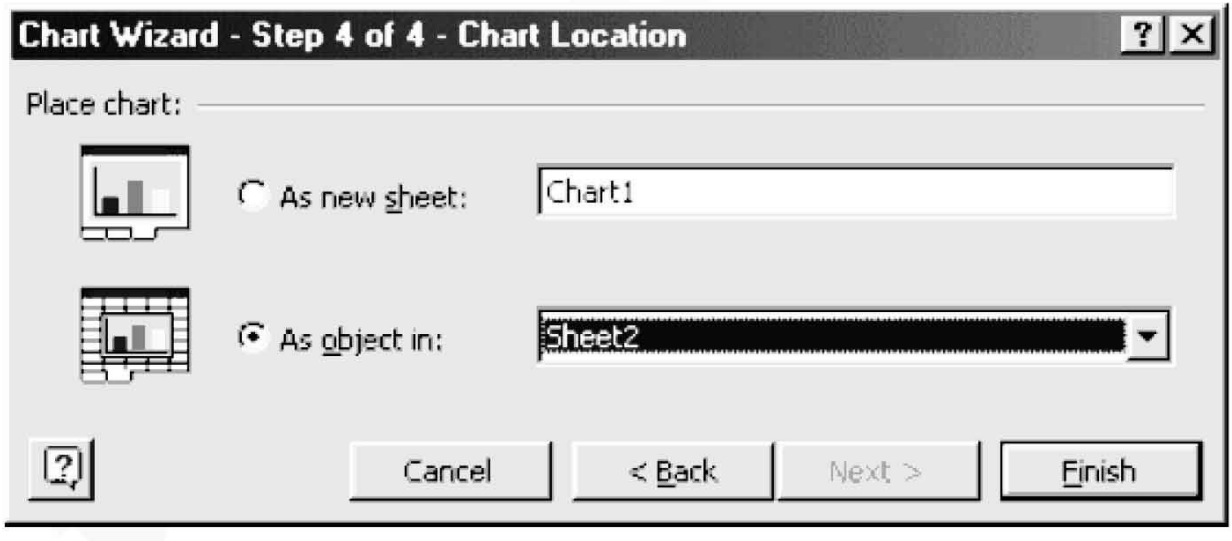
- **Chart Source Data:** Select the data range (if different from the area highlighted in step 1) and click **Next**.



- **Chart Options:** Enter the name of the chart and titles for the X- and Y-axes. Other options for the axes, grid lines, legend, data labels, and data table can be changed by clicking on the tabs. Press **Next** to move to the next set of options.



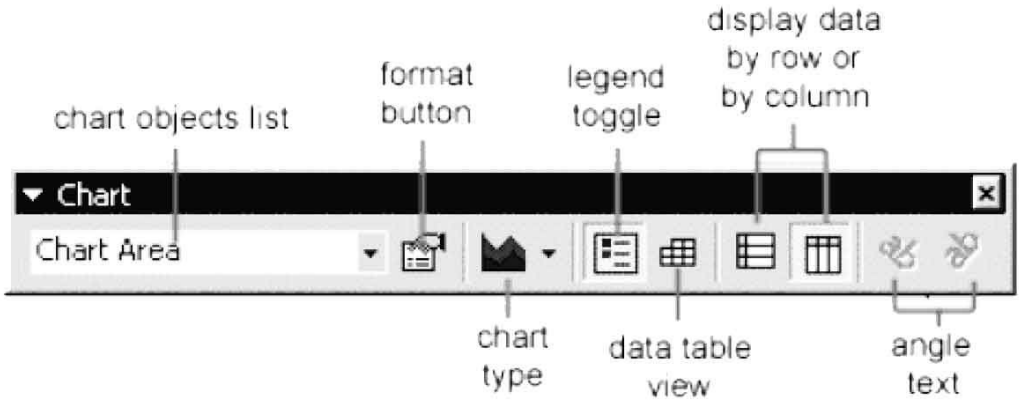
- **Chart Location:** Click **As new sheet** if the chart should be placed on a new, blank worksheet or select **As object in** if the chart should be embedded in an existing sheet and select the worksheet from the drop-down menu.



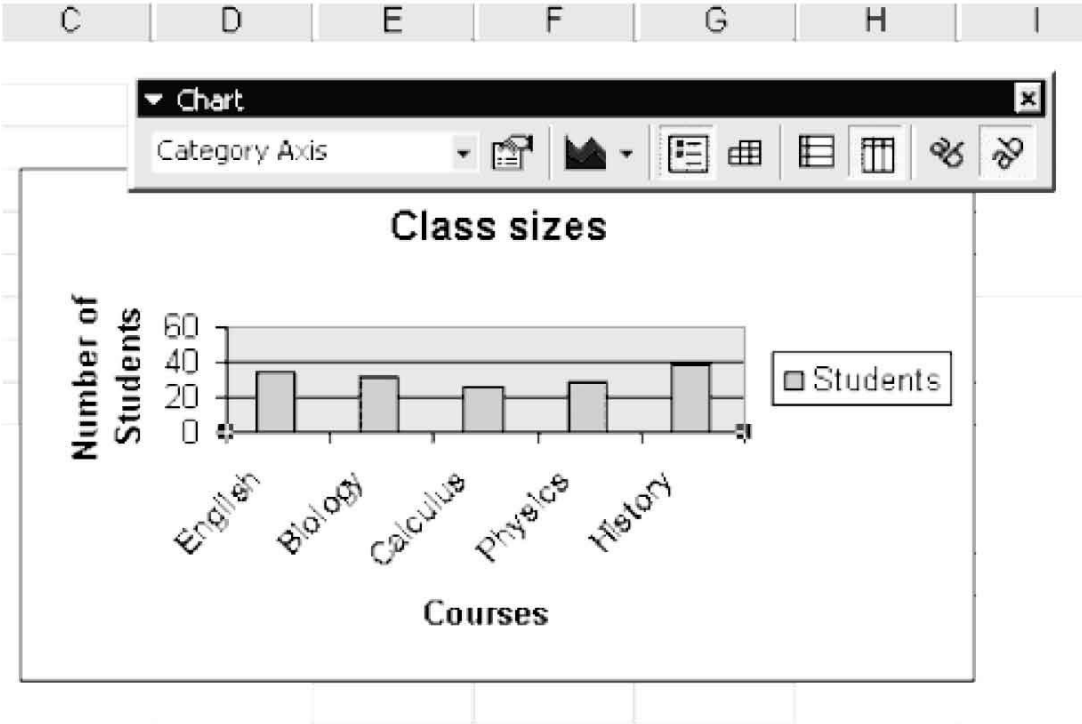
- Click **Finish** to create the chart.

	A	B
1		Students
2	English	34
3	Biology	32
4	Calculus	26
5	Physics	28
6	History	39

Chart Formatting Toolbar



- **Chart Objects List:** To select an object on the chart to format, click the object on the chart or select the object from the **Chart Objects List** and click the **Format button**. A window containing the properties of that object will then appear to make formatting changes.
- **Chart Type** - Click the arrowhead on the chart type button to select a different type of chart.
- **Legend Toggle** - Show or hide the chart legend by clicking this toggle button.
- **Data Table view** - Display the data table instead of the chart by clicking the Data Table toggle button.
- **Display Data by Column or Row** - Charts the data by columns or rows according to the data sheet.
- **Angle Text** - Select the category or value axis and click the **Angle Downward** or **Angle Upward** button to angle the selected by +/- 45 degrees.

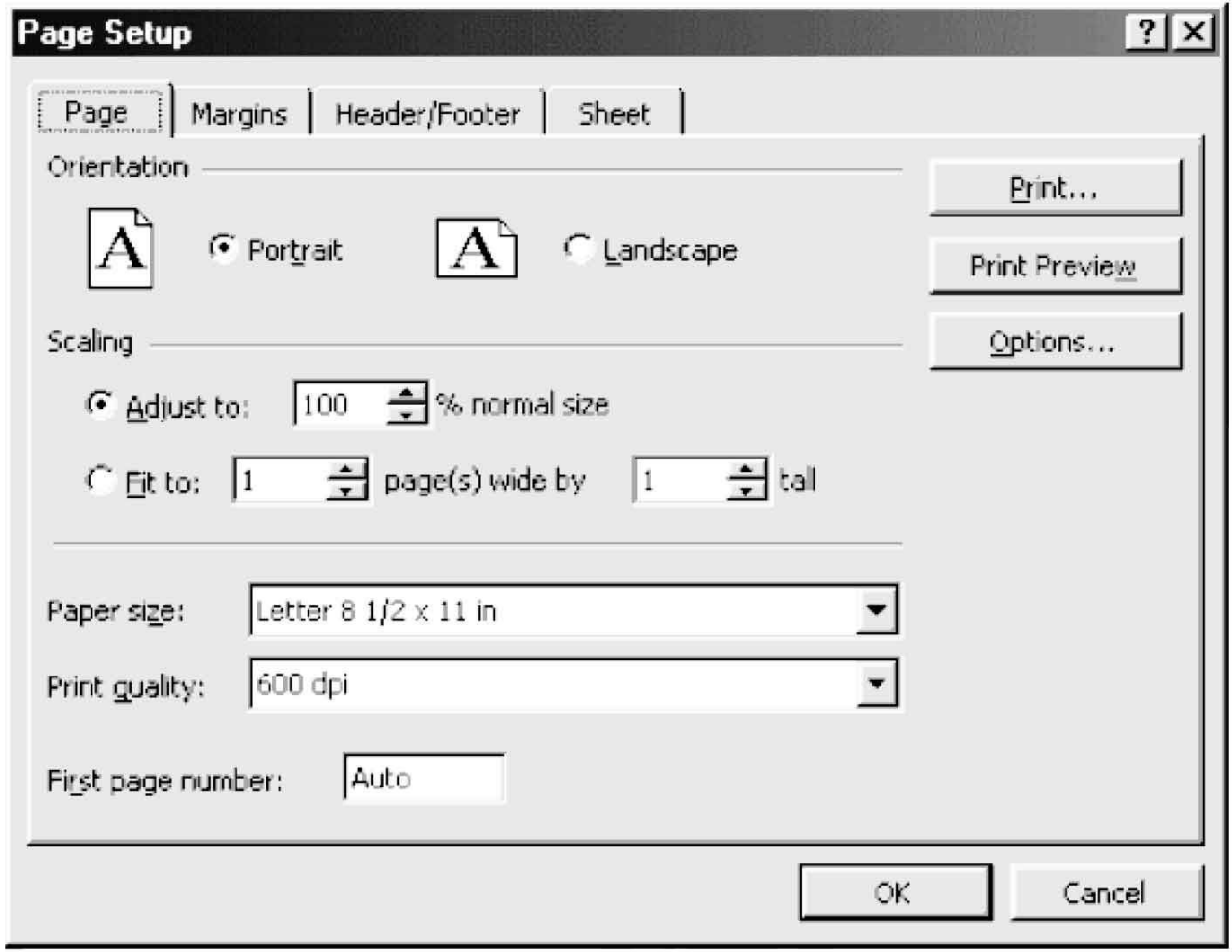


Q9. What is page setup of worksheets?

Select **Page Setup** from the **File** menu bar to format the page, set margins, and add headers and footers.

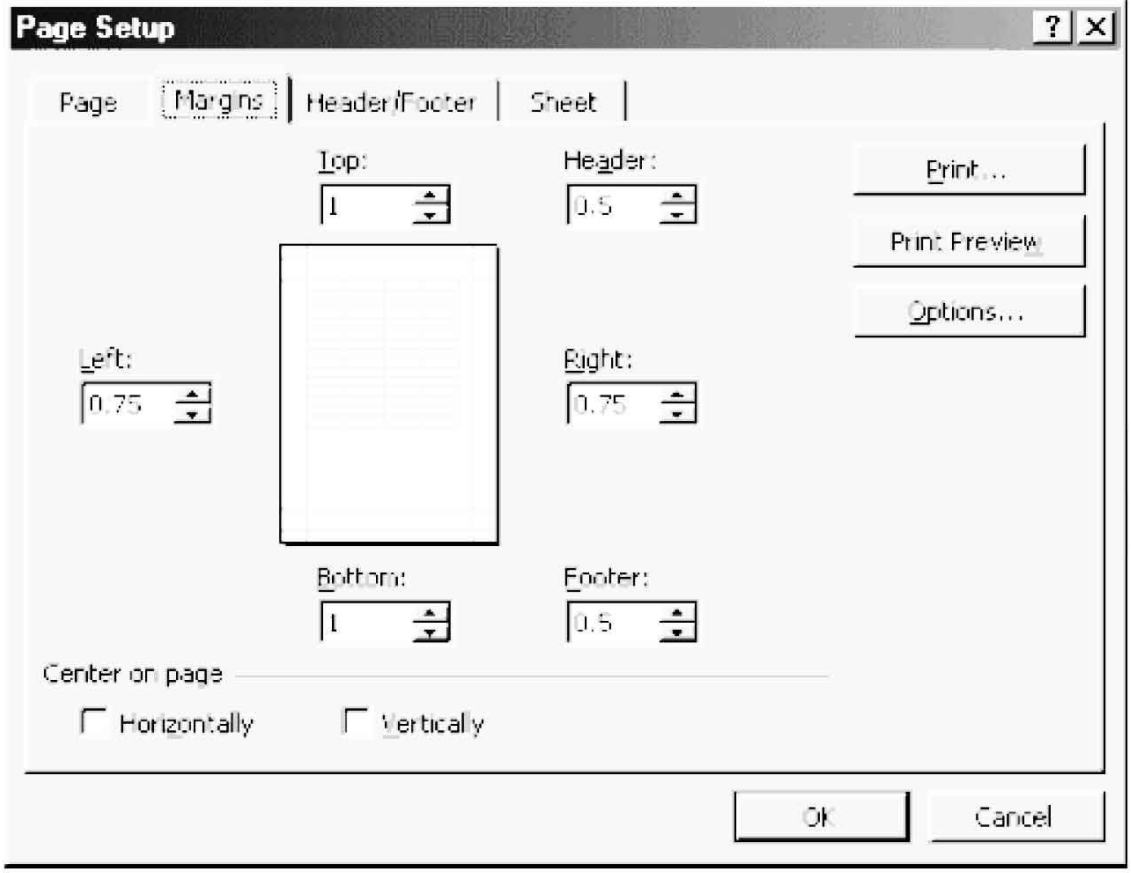
- **Page**

  Select the **Orientation** under the **Page** tab in the Page Setup window to make the page Landscape or Portrait. The size of the worksheet on the page can also be formatting under **Scaling**. To force a worksheet to print only one page wide so all the columns appear on the same page, select **Fit to 1 page(s) wide**.

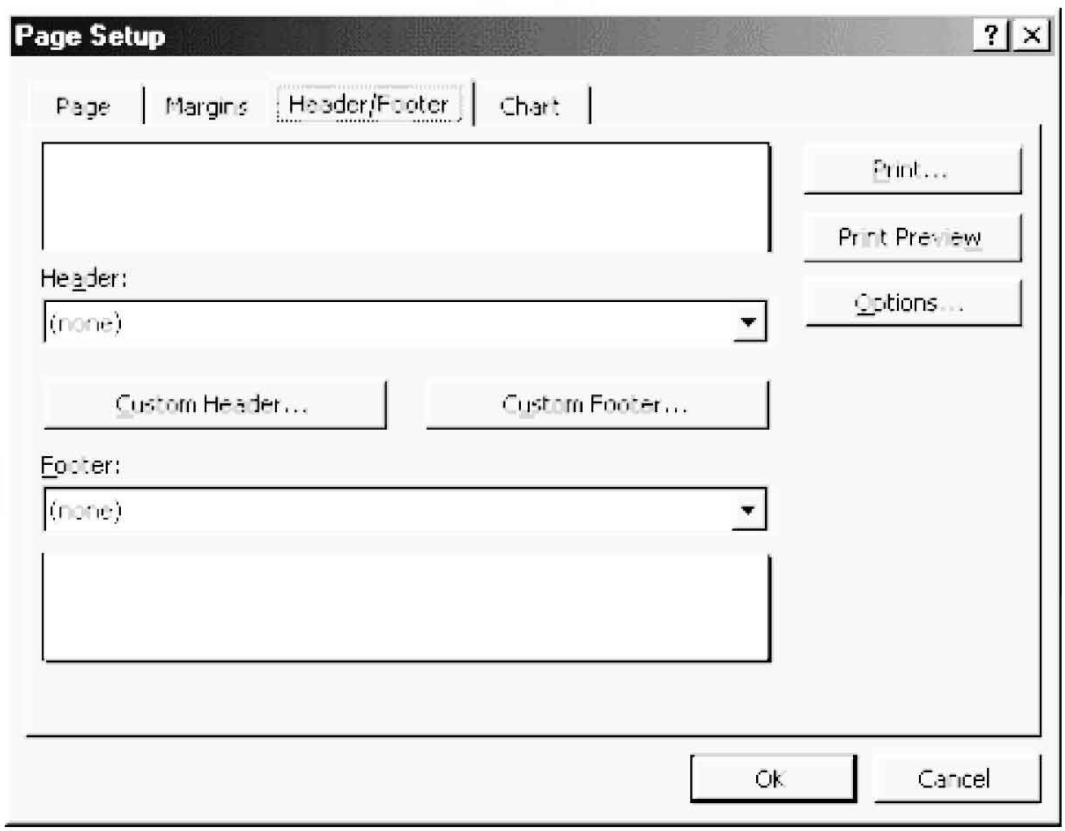


- **Margins**

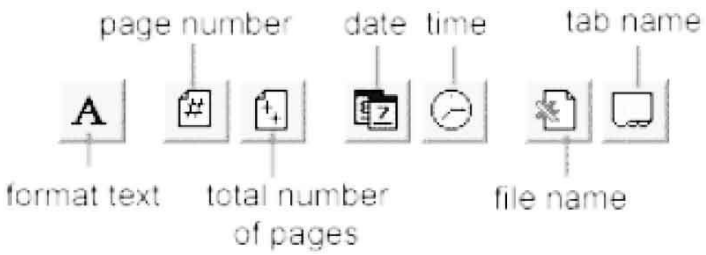
Change the top, bottom, left, and right margins under the **Margins** tab. Enter values in the header and footer fields to indicate how far from the edge of the page this text should appear. Check the boxes for centering horizontally or vertically on the page.



- **Header/Footer**
  Add preset headers and footers to the page by clicking the drop-down menus under the Header/Footer tab.

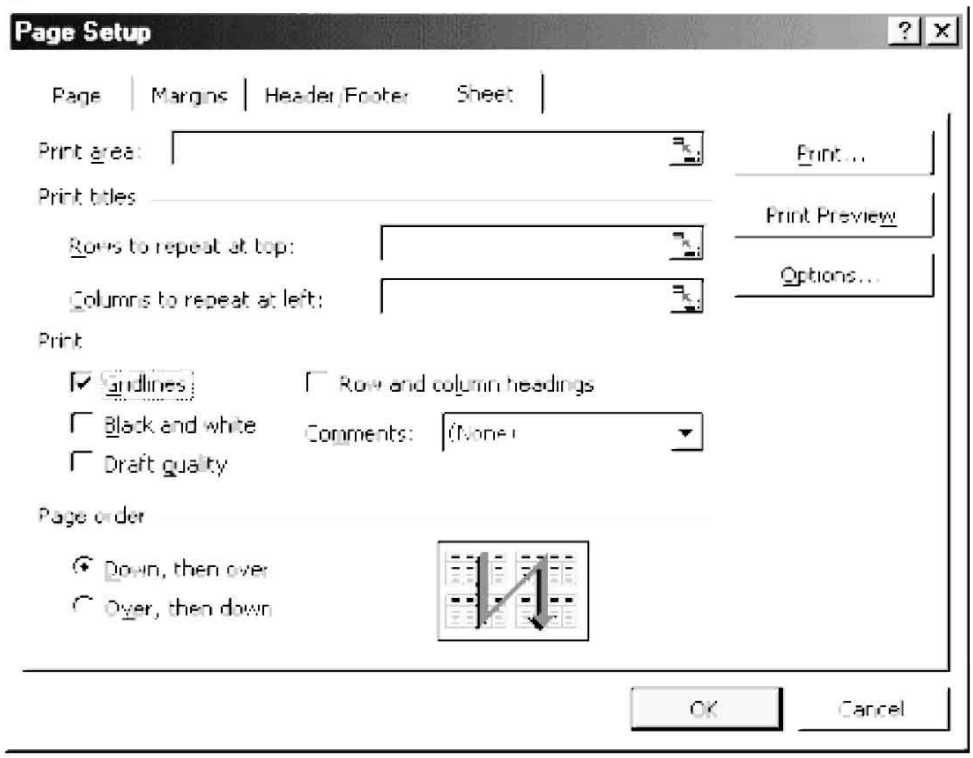


To modify a preset header or footer, or to make your own, click the **Custom Header** and **Custom Footer** buttons. A new window will open allowing you to enter text in the left, center, or right on the page.



Format Text - Click this button after highlighting the text to change the font, size, and style.
Page Number - Insert the page number of each page.
Total Number of Pages - Use this feature along with the page number to create strings such as "page 1 of 15".
Date - Add the current date.
Time - Add the current time.
File Name - Add the name of the workbook file.
Tab Name - Add the name of the worksheet's tab.

- **Sheet**
  Check **Gridlines** if you want the gridlines dividing the cells to be printed on the page. If the worksheet is several pages long and only the first page includes titles for the columns, select **Rows to repeat at top** to choose a title row that will be printed at the top of each page.

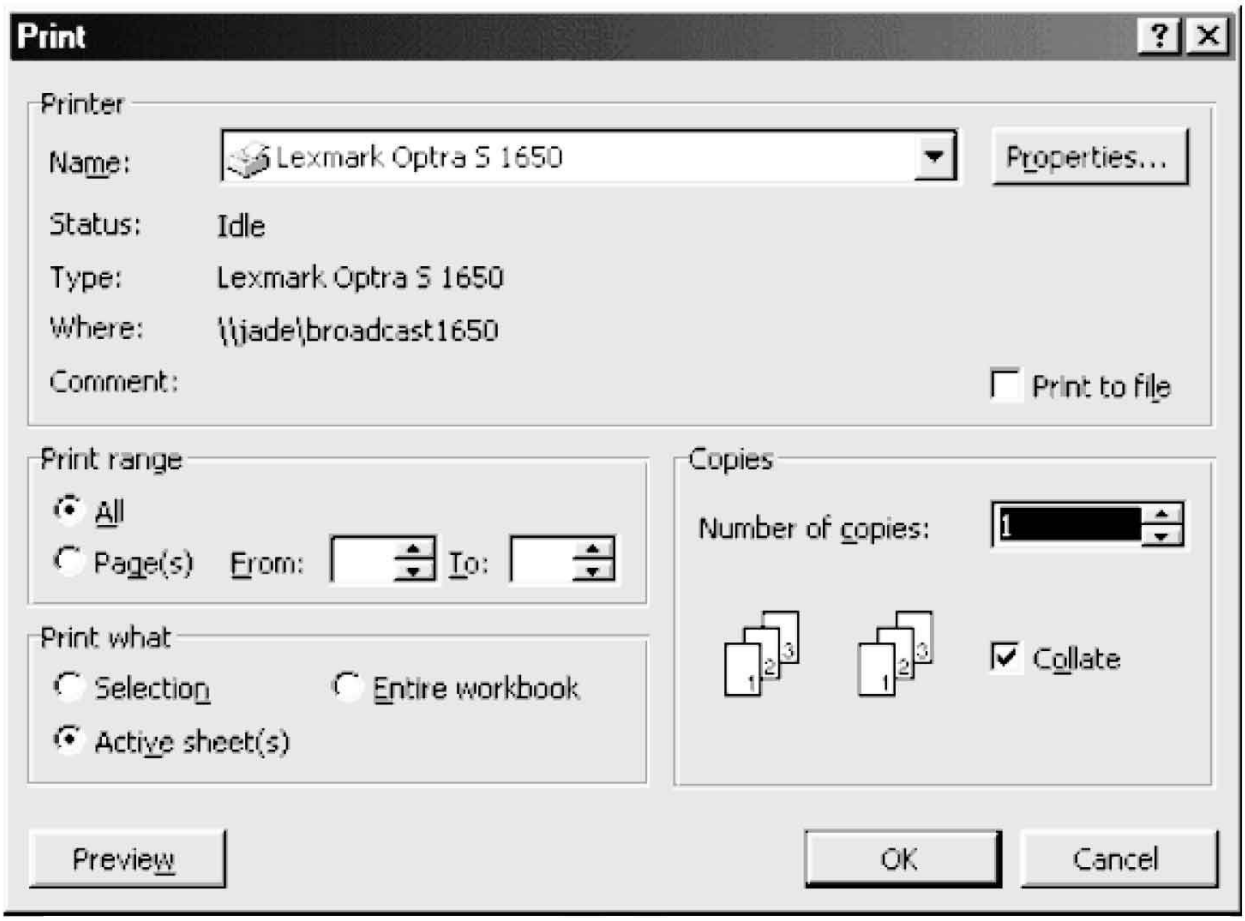


Print Preview

Select **Print Preview** from the **File** menu bar to view how the worksheet will print. Click the **Next** and **Previous** buttons at the top of the window to display the pages and click the **Zoom** button to view the pages closer. Make page layout modifications needed by clicking the **Page Setup** button. Click **Close** to return to the worksheet or **Print** to continue printing.

Q.10 Discuss the process of printing worksheet.

To print the worksheet, select **Print** from **File** menu bar.



- **Print Range** - Select either all pages or a range of pages to print.
- **Print What** - Select selection of cells highlighted on the worksheet, the active worksheet, or all the worksheets in the entire workbook.
- **Copies** - Choose the number of copies that should be printed. Check the **Collate** box if the pages should remain in order.

Q.11 What is difference between word processor and spreadsheet?

Sr.	Word Processor	Spreadsheet
(1)	Word processor provides the facility to create and edit documents.	Spreadsheet provides the facility of calculations.
(2)	The data in word processor is inserted in documents.	The data in spreadsheet is inserted in worksheets.
(3)	It provides no data validation facility.	It provides data validation facility.
(4)	It does not provide data analysis facility.	It provides data analysis facility such as filter, subtotal, pivot table and auditing.
(5)	It provides a small number of predefined	It provides many predefined functions

	functions to manipulate data.	to manipulate data.
(6)	It does not provide the facility of automatic recalculating of data.	It provides the facility of recalculating data. The result changes automatically if the data is changed.
(7)	Conditional formatting is not available in word processors.	Spreadsheets provide the facility of conditional formatting. Format of data is changed when it meets a certain criteria.
(8)	Word processor is used to create letters, applications, memos and reports etc.	Spreadsheet is used to create salary sheets, home budgets and balance sheet.

Q.12 What is difference between function and formula?

Sr.	Function	Formula
(1)	Function is predefined facility.	Formula is defined by the user.
(2)	Function is written in predefined syntax.	Formula is written according to the user requirements.
(3)	Function may require parameters.	Formula does not require parameters.
(4)	Function is identified by a particular name.	Formula has no particular name.
(5)	All functions are formulas.	All formulas are not functions.