

UNIT 4: ELECTRONIC SPREADSHEET

Chapter – 10: INTRODUCTION TO SPREADSHEETS

Answer the Following Questions

1. Spreadsheet software allows you to store, organise, calculate, and manipulate the available data in a tabular format, consisting of rows and columns. It provides inbuilt features and data analysis tools that make it easy to work with a large amount of data. It has an additional feature of representing data in the form of a chart that helps you to analyse data quickly.
2. Among many, three important features of Spreadsheet are:
 - a. Formulas and Functions: Formulas are mathematical expressions that are mainly used for performing simple and complex calculations. Functions are the built-in formulas which are used for calculating percentage, interest, average, etc., in MS Excel.
 - b. Formatting Features: These features are used for improving the appearance of data.
 - c. Auto Updation of Data: The data is automatically recalculated in the whole worksheet if any change is made in a single cell.
3. Some spreadsheet software are: Microsoft Excel, LibreOffice Calc, Gnumeric, Google Sheets.
4. A workbook is a collection of one or more worksheets, in a single file. Each workbook has a single theme and contains, at least, one worksheet. The workbook is designed to hold together multiple worksheets in order to organise and consolidate data efficiently.
5. The Formula bar is located at the top of the sheet. It is located to the right of the Name box. This bar shows the characters and formulas that you enter in an active cell. It shows the actual content of the cell. In Excel, if a function or formula is written in a cell, the cell displays the result or value, and the formula bar displays the function or formula applied. A formula or function always starts with an equal(=) sign. Whereas, the Name box is located above the column heading on the left hand side of the window. The unique cell name/cell reference is displayed in this box. It displays the location of the cell pointer.
6. A range is a group of contiguous cells, which are selected or denoted collectively. It can be as small as a single cell or as big as an entire worksheet. You can specify a range by writing the starting cell address followed by the ending cell address, both separated by a colon (:). For example, a range starting from C3 and ending in J10 would be written as B2:H8.

Chapter – 11: EDITING DATA IN A SPREADSHEET

Answer the Following Questions

1. You can enter three types of data in a spreadsheet, such as Numbers, Text, and Formulas.
2. Compound formulas are used when you need more than one operator. For example, $=A1+B1-D5$
3. Formulas are equations that perform calculations on values. It is an expression that can include cell addresses, numbers, arithmetic operators, and parenthesis. The result of the calculation is displayed in the cell where the formula is entered. Whereas, functions are pre-designed formulas to perform simple and complex calculations. They eliminate the chance to write wrong formulas. The functions are made up of two parts — Arguments and Structure.
4. **MAX():** The MAX function returns the largest value among the set of values in a given range of cells. This function only considers numeric entries and logical values as its arguments. If there are no valid arguments within the MAX function, it returns a value of 0. For Example, $=MAX(B4:E4)$.
MIN(): The MIN function returns the smallest value among the set of values in a given range of cells. This function only considers numeric entries and logical values as its arguments. If there are no valid arguments within the MIN function, it returns a value of 0. For Example, $=MIN(A1:D5)$.
5. **COUNT()** function counts the number of numeric entries, formulas, and date entries in a given range of cells. For Example, $=COUNT(A4: G4)$ will count the cells that contain numbers in the cells A4 through G4.

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SECTION 4: APPLICATION BASED QUESTIONS-(UNSOLVED)

1. In cell E1 type $=C1+D1$. Copy cell E1 and paste it to cells E2, E3, E4 and E5.
2. a. In cell E3 type $=((C3+D3)/100)*100$. Copy cell E3 and paste it to cells E4 to E7.
b. In cell F3 type $=IF(E3 \geq 90, "A+", "B")$. Copy cell F3 and paste it to cells F4 to F7.
c. In cell C10 type $=MAX(C3:C7)$
In cell D10 type $=MAX(D3:D7)$
In cell E10 type $=AVERAGE(C3:C7)$
In cell F10 type $=AVERAGE(D3:D7)$

SECTION 5: SHORT ANSWER TYPE QUESTIONS-(UNSOLVED)

1. A workbook is a collection of one or more worksheets, in a single file. Each workbook has a single theme and contains, at least, one worksheet. The workbook is designed to hold together multiple worksheets in order to organise and consolidate data efficiently. Whereas, a worksheet is composed of a very large number of cells, which are the basic storage unit for data in a file or workbook. Each sheet contains cells arranged in grid pattern using rows and columns.
2. **Row Header:** Each row in Excel is represented by a specific number, which is present on the left hand side of a worksheet. This number is known as a row header. Row headers are numbered from 1 to 1,048,576.

Column Header: Letters across the top border of a worksheet represent column headings, starting with A to Z, AA ... AZ, BA ... BZ, ... XAA ... XFD. Every worksheet in Excel contains 16,384 columns.

3. The Formula bar is located at the top of the sheet. It is located to the right of the Name box. This bar shows the characters and formulas that you enter in an active cell. It shows the actual content of the cell. In Excel, if a function or formula is written in a cell, the cell displays the result or value, and the formula bar displays the function or formula applied. A formula or function always starts with an equal(=) sign. Whereas, the Name box is located above the column heading on the left hand side of the window. The unique cell name/cell reference is displayed in this box. It displays the location of the cell pointer.
4. A range is a group of contiguous cells, which are selected or denoted collectively. It can be as small as a single cell or as big as an entire worksheet. You can specify a range by writing the starting cell address followed by the ending cell address, both separated by a colon (:). For example, a range starting from C3 and ending in J10 would be written as B2:H8.
5. The text entered in a cell by using the keyboard is called a label. A label can be a combination of both numeric and non-numeric data along with spaces. By default, the labels are left-aligned in a cell and are never used for calculation purposes. Whereas, the numeric data is called value in Excel and can contain the digits 0-9. By default, the values are right-aligned in a cell.
For example, 98Hello42, A2Z are labels. Whereas, 7902 is a value.
6. Basic formulas involve only one operator in a formula. Whereas, a compound formulas are used when you need more than one operator.
7. Arguments are input values to functions. Arguments can be numbers, text, logical values like True or False, range of cell references, or formulas that are enclosed within parenthesis.
8. SUM(): The SUM function adds all the numbers in a given range of cells that you specify as arguments. E.g. =SUM(C5:G10).
AVERAGE(): The AVERAGE function returns the average (arithmetic mean) of the arguments. The arguments can be a range of cells, simply numbers or numbers along with cell reference(s). E.g. =AVERAGE(A10:D20).

SECTION 6: LONG ANSWER TYPE QUESTIONS-(UNSOLVED)

1. Spreadsheet software allows you to store, organise, calculate, and manipulate the available data in a tabular format, consisting of rows and columns. It provides inbuilt features and data analysis tools that make it easy to work with a large amount of data. It has an additional feature of representing data in the form of a chart that helps you to analyse data quickly.

Among many, two important features of Spreadsheet are:

- a. Formulas and Functions: Formulas are mathematical expressions that are mainly used for performing simple and complex calculations. Functions are the built-in formulas which are used for calculating percentage, interest, average, etc., in MS Excel.
- b. Formatting Features: These features are used for improving the appearance of data.

2. Column range refers to the range of cells spread across a column. In this type of range, the column letter is constant whereas the row number varies. For example, a column range that includes rows 1 to 5 of column B will be written as B1:B5. Row range refers to the range of cells spread across a row. In this type of range, the row number is constant, whereas the column letter varies. For example, a row range that includes columns B to F of row 5 will be written as B5:F5.
3. Editing data in a cell involves changing cell contents, copying and moving data, inserting and deleting rows and columns. The data or formula you typed in Excel can be seen in the cell and Formula bar. You can use the Formula bar to edit the data or formula in a cell. The two buttons-Cancel X and Enter .J become active on the Formula bar when you start typing in a cell. The Cancel button is used to cancel the data entry without pressing DELETE key, whereas clicking on the Enter button is equivalent to the ENTER key. It completes your data entry. Sometimes, you may make mistakes while entering data in cells, so you need to edit the contents of cells. Cell contents can be modified in two ways:
 - a. By overwriting
 - b. By modifying cell contents partially
4. Spreadsheet software uses standard mathematical operators to perform basic mathematical calculations, such as addition(+), subtraction(-), multiplication(*), division(/), and exponentiation(^).
5. Rules to enter functions in spreadsheet are:
 - a. A function must begin with '=' sign.
 - b. A function name must be a valid Excel function, for example, SUM, AVERAGE, etc.
 - c. A function name must be followed by opening and closing parenthesis.
 - d. Parenthesis contains arguments within it, for example, =SUM (A1:AS). If there is more than one argument, then they should be separated by a comma, for example, (A1:AS, B1:B8).
6. a) Average() b) Max() c) Min()
7. COUNT() function counts the number of numeric entries, formulas, and date entries in a given range of cells. It recognises only numeric data entries. For Example, =COUNT(A4:G4) will count the cells that contain numbers in the cells A4 through G4.
8. MAX(): The MAX function returns the largest value among the set of values in a given range of cells. This function only considers numeric entries and logical values as its arguments. If there are no valid arguments within the MAX function, it returns a value of 0. For Example, =MAX(B4:E4).

Chapter – 12: FORMATTING DATA IN A SPREADSHEET

Answer the Following Questions

1. The Format Cells dialog box consists of the following tabs: Number, Alignment, Font Border, Fill, and Protection.
2. To format a range of cells with decimal values, do the following:
 - a. Select the cell or range of cells to be formatted.
 - b. Click on the Format button in the Cells group of the Home tab.
 - c. Select the Format Cells option from the drop-down list. Or Click on the drop-down arrow next to the Number Format box in the Number group of the Home tab. Select any one of the options for formatting numbers. Or Click on the Number dialog box launcher under the Home tab.
 - d. The Format Cells dialog box appears on the screen.
 - e. By default, the Number tab is selected. From the Category list, select the Number option.
 - f. In the Decimal places option, select the number of decimal places you want to display in the data.
 - g. Click on OK. You will observe the change in the format of the numbers.
3. Excel provides a variety of predefined Date and Time formats for different locales. To enter date type data use '/' to separate month, day and year. To enter time type data use ':' to separate hours, minutes and seconds.
4. To convert numeric data into labels, do the following:
 - Select the range of cells to be formatted as labels.
 - Click on Format > Cells. The Format Cells dialog box will appear on the screen.
 - Click on the Number tab.
 - Select Text under the Category section.
 - Click on OK.
5. Fill Handle is a feature that allows the user to extend and fill a series of numbers, dates, or even text to a desired number of cells. In the active cell of the spreadsheet, the Fill Handle is a small black box at the bottom right corner. Fill Handle tool eases the work of entering data. It is a shortcut way to fill cells by dragging the Fill Handle in the direction you want to fill. If the cell contains a number, the number will be filled in the series. If the cell contains text, the same text will be filled in the direction you choose.

Chapter – 13: USING CELL REFERENCE

Answer the Following Questions

1. A cell reference refers to a cell or range of cells on a spreadsheet, that can be used in a formula or function from one cell to the next along the row or column. A cell reference can be used to refer to the:
 - a. data from one or more contiguous cells on the worksheet.
 - b. data contained in different areas of a worksheet.
 - c. data on other worksheets in the same workbook.
2.
 - a. Sometimes, you need to copy a formula in which the content of the cell(s) associated with this formula must be fixed. In that condition, absolute cell referencing is used. In this case, you can keep the cell address constant and it is designated in a formula by the addition of a dollar sign (\$) preceding the column and the row referenced, e.g., \$D\$3, \$B\$24, \$A\$10:\$D\$16, etc. If you copy the formula = \$C\$5+\$D\$5+\$E\$5 from row 5 to row 6, the formula will remain = \$C\$5+\$D\$5+\$E\$5. If the same formula is pasted in cell I7, the formula will still remain = \$C\$5+\$D\$5+\$E\$5.
 - b. When a relative cell reference is copied across multiple cells, they get changed based on the relative position of rows and columns. The relative cell reference changes itself according to the relationship with the position in the cell(s) on the worksheet. If you copy the formula =C3+D3+E3 from row 3 to row 4, the formula will automatically become =C4+D4+E4. If the same formula is pasted in cell I7, the formula will become =F7+G7+H7.
 - c. A mixed reference is a reference that refers to a specific row or column. It is a combination of relative and absolute referencing. In this case, either one of the row or column is absolute (fixed) or the other is relative (changeable), for example, D\$3, \$B24, \$A10:\$D16, etc. If you copy the formula = \$C7+\$D7+\$E7 from row 7 to row 8, the formula will become = \$C8+\$D8+\$E8. If the same formula is pasted in cell I9, the formula will become = \$C9+\$D9+\$E9. Since the column reference is absolute, therefore, the column address will not change, whereas the relative row reference will change accordingly.
3. Relative and absolute references behave differently when copied and filled to other cells. Relative references change when a formula is copied to another cell. Absolute references, on the other hand, remain constant no matter where they are copied.

Chapter – 14: USING CHARTS IN A SPREADSHEET

Answer the Following Questions

1. A chart is a graphical representation of data in a worksheet.
2. In a Excel worksheet, chart helps to provide a better understanding of large quantities of data. Charts make it easier to draw comparison, see growth and relationship among the values and trends in data. They provide an accurate analysis of information.
3. Column chart.
4.
 - Line Chart: It is in the form of lines and used to illustrate trends in data at equal intervals. It is quite similar to plotting a graph on a graph paper with its values on the X and Y axis. It is useful in emphasising continuity by showing change in data over time. It is generally used to compare a trend for a period of time.
 - Pie Chart: This chart displays data in the form of a circle that is divided into a series of segments. It shows the proportional size of individual items that makes up a data series to the sum of items. It always shows only one data series and is useful when you want to emphasise a significant element. This chart type works best with a small number of values.
 - Bar Chart: It illustrates the data comparison between individual items. It displays data in the form of long rectangular bars that are placed horizontally in the chart area. In this type of chart, categories are represented on the vertical axis and values are represented on the horizontal axis.

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SECTION 4: APPLICATION BASED QUESTIONS-(UNSOLVED)

1.
 - a. D2 shows 2430
 - b. The formula becomes =B6+C6, the cell D6 shows 3335
 - c. The value shown in D6 remains the same, i.e., 3335
 - d. The formula in D3 shows =\$B3+\$C3, value shown is 2680
 - e. 490
2.
 - a. Bar chart
 - b. Student Attendance Record
 - c. B2:B5, C2:C5, D2:D5
 - d. Category axis: Marks, Value axis: Name

SECTION 5: SHORT ANSWER TYPE QUESTIONS-(UNSOLVED)

1. Category axis or X-axis is the horizontal axis of a chart. Whereas, Value axis or Y-axis is the vertical axis used to plot the values. It is located ON the left side.
2. Formatting features help to beautify the data and make the worksheet presentable. Formatting helps to enhance the overall look of the workbook.
3. Fill Handle is a feature that allows the user to extend and fill a series of numbers, dates, or even text to a desired number of cells. In the active cell of the spreadsheet, the Fill Handle is a small black box at the bottom right corner. Fill Handle tool eases the work of

entering data. It is a shortcut way to fill cells by dragging the Fill Handle in the direction you want to fill. If the cell contains a number, the number will be filled in the series. If the cell contains text, the same text will be filled in the direction you choose.

4. A cell reference refers to a cell or range of cells on a spreadsheet that can be used in a formula or function from one cell to the next along the row or column. A cell reference can be used to refer to the:
 - data from one or more contiguous cells on the worksheet.
 - data contained in different areas of a worksheet.
 - data on other worksheets in the same workbook.

There are three types of cell referencing. They are:

- a. **Absolute Referencing:** Sometimes, you need to copy a formula in which the content of the cell(s) associated with this formula must be fixed. In that condition, absolute cell referencing is used. In this case, you can keep the cell address constant and it is designated in a formula by the addition of a dollar sign (\$) preceding the column and the row referenced, e.g., \$D\$3, \$B\$24, \$A\$10:\$D\$16, etc. If you copy the formula = \$C\$5+\$D\$5+\$E\$5 from row 5 to row 6, the formula will remain = \$C\$5+\$D\$5+\$E\$5. If the same formula is pasted in cell I7, the formula will still remain = \$C\$5+\$D\$5+\$E\$5.
 - b. **Relative Referencing:** When a relative cell reference is copied across multiple cells, they get changed based on the relative position of rows and columns. The relative cell reference changes itself according to the relationship with the position in the cell(s) on the worksheet. If you copy the formula =C3+D3+E3 from row 3 to row 4, the formula will automatically become =C4+D4+E4. If the same formula is pasted in cell I7, the formula will become =F7+G7+H7.
 - c. **Mixed Referencing:** A mixed reference is a reference that refers to a specific row or column. It is a combination of relative and absolute referencing. In this case, either one of the row or column is absolute (fixed) or the other is relative (changeable), for example, D\$3, \$B24, \$A10:\$D16, etc. If you copy the formula = \$C7+\$D7+\$E7 from row 7 to row 8, the formula will become = \$C8+\$D8+\$E8. If the same formula is pasted in cell I9, the formula will become = \$C9+\$D9+\$E9. Since the column reference is absolute, therefore, the column address will not change, whereas the relative row reference will change accordingly.
5. A chart is a graphical representation of data in a worksheet. In a Excel worksheet, chart helps to provide a better understanding of large quantities of data. Charts make it easier to draw comparison, see growth and relationship among the values and trends in data. They provide an accurate analysis of information.

SECTION 6: LONG ANSWER TYPE QUESTIONS-(UNSOLVED)

1. In Excel, The Home tab provides common text formatting tools that you can use to make changes in the appearance of text. To apply formatting, first you need to select the appropriate cell or range of cells, and then click on the corresponding tool available in the Font group of the Home tab. Apart from formatting text, you can make changes in the

format of values using the Format Cells dialog box. The Format Cells dialog box has various tabs, such as Number, Alignment, Font, Border, Fill, and Protection. To open the Format Cells dialog box, click on the dialog box launcher in the Number group. The Format Cells dialog box opens with the Number tab, by default.

2. To format numbers into labels, follow these steps:
 - a. Select the range of cells to be formatted as labels.
 - b. Click on Format > Cells. The Format Cells dialog box will appear on the screen.
 - c. Click on the Number tab.
 - d. Select Text under the Category section.
 - e. Click on OK.
 - f. Observe that the data formatted as labels appear left-aligned.

The Scientific format (also referred to as Standard or Standard Index Form) is a compact way to display very large or very small numbers. To format numbers into scientific format, do the following:

- a. Select the range of cells to be formatted as scientific.
 - b. Click on Format > Cells. The Format Cells dialog box will appear on the screen.
 - c. Click on the Number tab.
 - d. Select Scientific under the Category section.
 - e. Click on OK.
 - f. Observe that the data formatted in scientific format.
3. The Alignment tab is used to set the horizontal and vertical alignment of data in cells. To set a particular alignment, follow the given steps:
 - Select the cell or range of cells to be aligned.
 - Click on Format > Cells. The Format Cells dialog box will appear on the screen.
 - Select the Alignment tab from the dialog box.
 - Select the desired horizontal alignment from the Horizontal drop-down list.
 - Select the desired vertical alignment from the Vertical drop-down list.
 - Click on OK. You can now notice the change in the alignment of the text.
4. The various components of a chart:
 - Chart Area: Chart area includes all the area and objects in the chart.
 - Category Axis: Category axis or X-axis is the horizontal axis of a chart.
 - Value Axis: Value axis or Y-axis is the vertical axis used to plot the values. It is located on the left side
 - Data Series: Data series are the bars, slices or other elements that show the data values. If there are multiple data series in the chart, each will have a different colour or style.
 - Category Name: Category names are the labels, which are displayed on the X and Y axis.
 - Plot Area: Plot area is a window within the chart area. It contains the actual chart itself and includes plotted data, data series, category, and value axis.
 - Legend: It depicts the colours, patterns, or symbols assigned to the data series. It helps to differentiate the data.

- Chart Title: It describes the objective of the chart.
 - Grid lines: These can either be horizontal or vertical lines depending on the selected chart type. They extend across the plot area of the chart. Gridlines make it easier to read and understand the values.
5. Excel provides a variety of predefined Date and Time formats for different locales. To enter date type data use '/' to separate month, day and year.

