

FORMULAS and FUNCTIONS

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1. FORMULAS are used to perform calculations involving addition, subtraction, division, and multiplication, ~~etc.~~

FUNCTIONS are the pre-defined or inbuilt formulas in MS-Excel.

A Formula must begin with an equal to (=) symbol followed by cell reference and operators. It may contain a few or all of the below-mentioned elements:

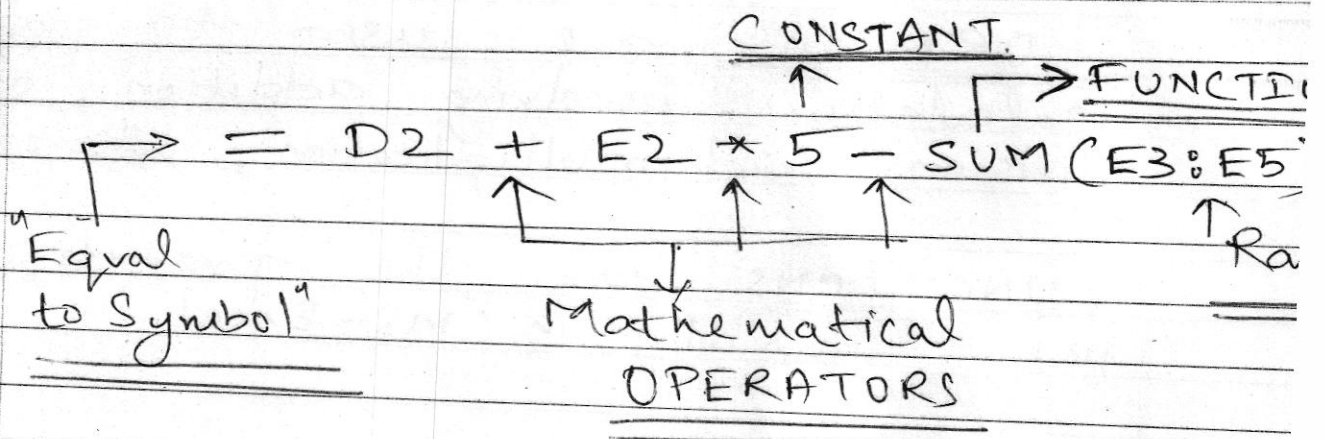
REFERENCES: A cell or a range of cells that you want to include in your calculation.

OPERATORS: SYMBOLS (+, -, \*, ^, %, \$, #, etc.).

CONSTANTS: Numbers or text values that do not change.

FUNCTIONS: Pre-defined formulas in Excel.

## 2. ELEMENTS OF FORMULAS



## 2. CREATING A BASIC FORMULA.

A BASIC FORMULA involves only one type of operator in it.

EXAMPLE:

1. Enter the data in the CELLS
2. CLICK on the cell where the result has to be displayed and type "=" sign.
3. CLICK on the cell B2 (~~Step~~ First cell of The Range). A Dashed border called MARQUEE will appear around it. Its address will appear in the CELL in (2) above and in the FORMULA BAR.  
This method of clicking on the cell to add its reference to a formula is called 'Pointing'.  
The Status bar will display the status of Point.
4. Now type "+" symbol.
5. Repeat "STEPS 3 & 4" till "B7" or TYPE:  $=B2+B3+B4+B5+B6+B7$  in B8. You will notice the different coloured borders appearing around these cells.
6. Press "ENTER" key. CELL B8 will display TOTAL



## 4. USING COMPOUND FORMULA

COMPOUND FORMULAS are used when more than one operator is required to perform calculation. Let us use it to calculate the Simple Interest by using the formula:

$$S.I = \frac{P \times R \times T}{100}$$

1. CLICK on the CELL B6 and type '='.
2. CLICK on the cell B2.  
The cell address of B2 appears in the cell B6.
3. Type the symbol '\*' and click on the cell B3.
4. Again type the symbol '\*' in B6 and click on the cell B4.  
Now type the symbol '/' followed by 100 in the cell B6 displays the calculated Simple Interest and the result is displayed in cell B6.

## 5. USING FORMULA ON TEXT

In Addition to operations on numbers with FORMULAS, there are FORMULAS that can be applied to TEXT.

One such example is addition on character and string data type. Only Addition is allowed.

the COPY button.

2. Select the cell C8 and click on the PASTE button.

3. Observe that the CELL reference in C8 changes automatically from B2:B7 to C2:C7.

### III. ABSOLUTE REFERENCE.

Absolute Reference is used when we do not want to change the address of the cell while copying the formula to another cell. To use absolute reference in a cell, you need to add dollar (\$) sign before the column and the row number. example:  $=\$A\$1+\$A\$2$

### III. MIXED REFERENCE!

It is a combination of Relative and Absolute Reference, where either Row or Column has to remain fixed.

### 8. CELL REFERENCE OF ANOTHER WORKSHEET

You can use the cell reference of one worksheet in another worksheet.

### I. USING COPY-PASTE OPTION

1. CLICK ON THE WORKSHEET1 TAB and Enter the data.

2. CLICK ON WORKSHEET2. Now, click on cell B8 where the SUM function is used.



3. COPY the FORMULA using CTRL

4. CLICK on the Sheet 1 and CLICK on the DESTINATION CELL (B8).  
PASTE the FORMULA using Ctrl + V

## II. USING SHEET REFERENCE.

It uses sheet number, exclamation mark and cell address.

example: Sheet 1 | D2.

## 9. FUNCTIONS

Functions are the pre-designed formulas in Excel to perform both simple and complex calculations. Functions save time and eliminate the chance to write wrong formulas. They accept Arguments and return Values.

ARGUMENTS are the input values to functions upon which calculation are performed to find out the final result. These values can be numbers, text etc. and are enclosed within parenthesis.

Functions begin with the equal to (=) sign followed by the function name and then the List of arguments separated by comma within the parenthesis.

For example, = Function name (argument 1, argument 2, ...)

The Ampersand Symbol (&) is used to perform addition. Addition of two or more text values is called Concatenation.

| A        | B     | C |
|----------|-------|---|
| 1   Kips | India |   |

Enter = A1 & B1 in cell C1 and Press the Enter key. It will display KipsIndia in C1.

## 6. CELL RANGE

A RANGE is a group of contiguous cells, which form the shape of a Rectangle. It can be a group of two cells 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 ":". For example, C1:C10 indicates a range starting from cell C1 and with cell C10.

### SELECTING A RANGE.

1. CLICK on the first cell in the range and while holding down the left mouse button, drag it to the last cell. Or

CLICK on the first cell and hold down the SHIFT key while you press the ARROW keys to extend the selection by using the ARROW keys.

2. To stop extending the selection, press F8 again.



## 4. CELL REFERENCE AND ITS TYPES

### USING A RANGE IN FORMULA

- 1) Type the data as shown in fig.   
 CLICK on the CELL B8 and type the formula  $=SUM(B2:B7)$
- 2) Press the ENTER key. The TOTAL will be displayed in the cell B8.

|   | A           | B                 | C |
|---|-------------|-------------------|---|
| 1 | Month       | No. of Units Sold |   |
| 2 | JAN         | 1000              |   |
| 3 | Feb         | 2000              |   |
| 4 | Mar         | 1500              |   |
| 5 | Apr         | 2000              |   |
| 6 | Total Sales | $=SUM(B2:B7)$     |   |

## 7. CELL REFERENCE AND ITS TYPES

The CELL Reference is the cell Address. There are three types of cell reference.

### 1. RELATIVE REFERENCE.

When you create a formula, reference to a cell or ranges are usually based on the position relative to the cell. When you copy or move the formula to other cells, the reference to the cell automatically gets changed.

Example: In A3,  $=A1+A2$

1. SELECT the cell B8, in which formula  $=SUM(B2:B7)$  is written. CLICK ON



## RULES TO ENTER A FUNCTION.

1. All Excel Functions must begin with "=" sign.
2. Function name must be a valid Excel name. For example, SUM, AVERAGE.
3. Function name must be followed by an opening and closing parenthesis.
4. Arguments are enclosed in the parenthesis.

## 10. COMMON FUNCTIONS

### I. AUTOSUM

The AutoSum option, besides being the most common and the fastest way to find out the total of the given numbers in a range, also provides options to find Average, Count, Max, Min, etc. You can find this option in two places.

1. In the Editing group on the Home tab.
2. In the Function Library group on the Formulas tab.

### II. SUM()

The Sum function returns the total of the range values.

### III. MAX()

MAX Function is used to find the largest value in the given range.

### IV. TODAY()

It is used to display the current date.

Some more commonly used functions are given below:

1. SUM(range)
2. AVERAGE(range)
3. ODD(number)
4. INT(number)
5. PRODUCT(range)
6. ROUND(number, num\_digit)
7. EXP(number)
8. SQRT(number)
9. POWER(number, power)
10. MOD(number, divisor)



A. FILL IN THE BLANKS:

1. FORMULAS are used to perform CALCULATIONS.
2. The cell address in a formula is also called CELL REFERENCE.
3. The cell address in a formula that does not change on copying is considered as ABSOLUTE REFERENCE.
4. ARGUMENTS are input to functions which accept values as number or text.
5. The & character is used for concatenation of strings.

B. STATE TRUE OR FALSE.

1. Formulas must begin with a question mark (?). FALSE.
2. In Absolute Referencing, the relative position of rows and columns changes where you copy a formula. FALSE.
3. EXCEL has clubbed all the functions in the FORMULAS Library group. FALSE.

4. A Range can be used in a formula. TRUE

5. The error #VALUE occurs if the number is divided by zero. TRUE

### C. MULTIPLE CHOICE QUESTIONS:

1. To use the Sheet reference, which address is appropriate out of the following options?

A. D4!Sheet1

B. Sheet1, D4

☒ C. Sheet1!D4

2. Which key combination is used to get the sum of the values of Adjacent cells?

A. Shift + S

B. Ctrl + =

☒ C. ALT + =

3. Which function finds the largest number in a range?

A. AVERAGE()

B. COUNT()

☒ C. MAX()

4. Which of the given cell references can be used in a relative reference?

A. \$D6

~~B. A3~~

C. A\$1

5. Which function is used to count the number of numeric values in a range?

~~A. COUNT()~~

B. SUM()

C. MAX()

D. ANSWER THE FOLLOWING:

Q.1. What is a Formula? Explain with the help of an example.

Formulas are used to perform calculations involving addition, subtraction, division and multiplication, where it establishes a relationship between two or more cells. It is an expression that can include cell addresses, numbers, arithmetic operators and parenthesis.

Using it, you can perform simple as well as complex calculations.

A Formula must begin with an equal to (=) symbol followed by cell references and operators. It may contain a few or all of the below-mentioned elements:

References: A cell or a range of cells that you want to include in your calculation.

Operators: Symbols (+, -, \*, ^, %, # etc.)



that specify the operation to be performed.

Constants : Numbers or Text values that do not change.

Functions : Pre-defined Formulas in Excel.

Example :

$$= A4 + B3 * 5 - \text{SUM}(E3:E5)$$

Here,  $+$ ,  $*$ ,  $-$  are Mathematical Operators.

$E3:E5$  is called Range.

$\text{SUM}(E3:E5)$  is the ~~Box~~ FUNCTION to ~~calculate~~ calculate the sum of the numbers in the given Range.

Q2. What is cell Reference? Mention types.

The cell address that we use in the formula is known as the cell reference.

Example: A1 where A denotes the column name and 1 denotes the Row number. With references, you can use the data from different parts of the worksheet or different sheets of the

workbook.

## TYPES OF REFERENCE:

1. RELATIVE Reference.
2. ABSOLUTE Reference.
3. MIXED Reference.

Q3. What do you know about Mixed Reference? Explain with the help of an example.

It is a combination of Relative and Absolute reference. In this reference, either row or column has to remain fixed.  $\$A1 + A\$2$  is an example of Mixed Reference.

Let us calculate the actual monthly expenses:

1. Type 100 in cell E12. Click on the cell E2.
2. Type  $=\$C2 - E\$12$ . Press the Enter key.

3. You can calculate the Actual Expenses of other cells by dragging the mouse pointer to the rest of the cells when it changes to the (+) symbol.

Q4. What do you mean by a Function?  
Name some of the commonly used functions in MS Excel.

FUNCTIONS are the pre-designed formulas in Excel to perform both simple and complex calculations. Functions save time and eliminate the chance to write wrong formulas. They accept Arguments and return Values.

Arguments are the input values to functions upon which calculations are performed to find out the final result. These values can be numbers, text, etc., and are enclosed within parenthesis.

Functions begin with the equal to (=) sign followed by the function name and then the list of arguments separated by comma within the parenthesis.

Commonly Used Functions are:

1. SUM() — Gives the sum of a range.
2. POWER(a, n) — Returns  $a^n$  or  $a \times a \times a \dots \times a$   $\rightarrow n$  times.
3. SQRT(number) — Returns a square root.
4. ROUND(n, d) — Rounds the number to the specified digit.