

Class: BSc

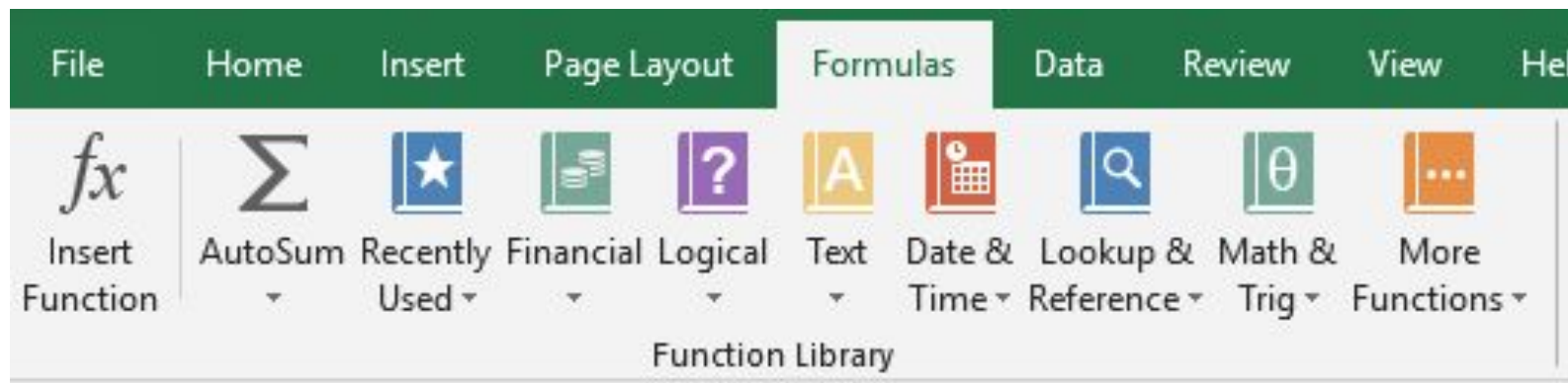
Subject : Application of IT- Basics Excel

Chapter: Unit 3 Chapter 2 = Part 1

Chapter Name: Writing Formula

Formula – Understanding Basics

- *What makes any spreadsheet program powerful and most useful is "Formulas", had it not been for Excel's Formula's it would have just been another "Word-processor"*
- *You use formulas in your Excel worksheets to calculate results from the data stored in the worksheet. When data changes, the formulas calculate updated results with no extra effort on your part*



Formula – Understanding Basics

- *A formula is a special code entered into a cell.*
- *It performs calculations of some type and returns a result, which is displayed in the cell.*
- *Formulas use a variety of operators and worksheet functions to work with values and text. The values and text used in formulas can be located in other cells, which makes changing data easy and gives worksheets their dynamic nature.*

Formula – Understanding Basics

A formula can consist of any of these elements:

- Mathematical operators, such as + (for addition) and * (for multiplication)*
- Cell references (including named cells and ranges)*
- Values or text*
- Worksheet functions (such as SUM or AVERAGE)*

Formula – Understanding Basics

After you enter a formula, the cell displays the calculated result of the formula. The formula itself appears in the Formula bar when you select the cell

H6										
	A	B	C	D	E	F	G	H	I	
1										
2										
3	Val1	Op	Val2	Op	Val3	Op	Val4	Result	Formula	
4	10	+	14	x	21	-	7	297	=A4+C4*E4-G4	
5								336	=PRODUCT(SUM(A4+C4)*SUM(E4-G4))	
6								206	=SUM(A4+PRODUCT(C4*SUM(E4-G4)))	
7								297	=SUM(A4+PRODUCT(C4*E4)-G4)	
8								497	=SUM(PRODUCT(SUM(A4+C4)*E4)-G4)	



Understanding
Formulas

Formula – Understanding Basics

Formula Examples:

Val1	Op	Val2	Op	Val3	Op	Val4	Result	Formula
2	+	2	x	3	-	4	4	=A4+C4*E4-G4
							-4	=PRODUCT(SUM(A4+C4)*SUM(E4-G4))
							0	=SUM(A4+PRODUCT(C4*SUM(E4-G4)))
							4	=SUM(A4+PRODUCT(C4*E4)-G4)
							8	=SUM(PRODUCT(SUM(A4+C4)*E4)-G4)
							1,67,77,216	=PRODUCT(((A4^C4)^E4)^G4)
							19	=SUM(A4+RANDBETWEEN(3,139))

Note: Every formula begins with an equal sign (=). The initial equal sign allows Excel to distinguish a formula from plain text.

Formula – Understanding Basics

Using operators in formulas

Excel formulas support a variety of operators. Operators are symbols that indicate what mathematical operation you want the formula to perform

Operator	Name
+	Addition
-	Subtraction
*	Multiplication
/	Division
^	Exponentiation
&	Concatenation
=	Logical comparison (equal to)
>	Logical comparison (greater than)
<	Logical comparison (less than)
>=	Logical comparison (greater than or equal to)
<=	Logical comparison (less than or equal to)
<>	Logical comparison (not equal to)

You can, of course, use as many operators as you need to perform the desired calculation.

Formula – Understanding Basics

When Excel calculates the value of a formula, it uses certain rules to determine the order in which the various parts of the formula are calculated. You need to understand these rules so your formulas produce accurate results.

Exponentiation has the highest precedence (performed first) and logical comparisons have the lowest precedence (performed last).

*^ Exponentiation 1
* Multiplication 2
/ Division 2
+ Addition 3
– Subtraction 3
& Concatenation 4
= Equal to 5
< Less than 5
> Greater than 5*

You can use parentheses to override Excel's built-in order of precedence.

Formula – Understanding Basics

Caution

In some cases, if your formula contains mismatched parentheses, Excel may propose a correction to your formula. You may be tempted simply to accept Excel's suggestion, but be careful – in many cases, Excel suggests a syntactically correct formula, but not the formula you had in mind.

When you're editing a formula, Excel lends a hand in helping you match parentheses by displaying matching parentheses in the same colour.

The image shows a close-up of an Excel formula bar. The formula entered is =PRODUCT(((A4^C4)^E4)^G4). The parentheses are color-coded to show matching pairs: the first '(' is blue and the last ')' is blue; the second '(' is red and the second ')' is red; the third '(' is purple and the third ')' is purple. This visual aid helps users ensure their formulas are syntactically correct.

=PRODUCT(((A4^C4)^E4)^G4)|

Formula – Understanding Basics

Using functions in your formulas

Formulas you create use worksheet functions. These functions enable you to greatly enhance the power of your formulas and perform calculations that are difficult (or even impossible) if you use only the operators discussed previously.

o =AVERAGE(A1:A10)

o =MAX(A1:D100)

o =PROPER(A1)

Entering Formulas

New Functions in Excel 2013

Function	Action
ISFORMULA	Returns TRUE if the referenced cell contains a formula
FORMULATEXT	Returns the formula in the referenced cell, as text
SHEET	Returns the sheet number of the referenced sheet. For example, =SHEET("Sheet3") returns the sheet number for Sheet3.
SHEETS	Returns the number of sheets in a workbook. For example, =SHEETS() returns the number of sheets in the workbook.
IFNA	If a reference contains an #NA error, returns other text you specify

These functions are not backward compatible. Meaning, if you use any of these new functions, they won't work if the file is opened with an earlier version of Excel.

Entering Formulas

Functions vary in how they use arguments. Depending on what it has to do, a functions may

- No arguments*
- One argument*
- A fixed number of arguments*
- An indeterminate number of arguments*
- Optional arguments*

=NOW() or =TODAY() □ take no arguments

=INDIRECT(A2) □ takes one argument

Entering Formulas

- *If a function uses more than one argument, you must separate each argument with a comma.*
- *Excel has more than 450 functions. You can even create your own custom functions (by using VBA)*
- *Excel provides additional assistance when you create formulas by displaying a drop-down list that contains function names and range names. The items displayed in the list are determined by what you've already typed.*
- *For example, if you're entering a formula and then type the letters SU, you'll see the drop-down list. If you type an additional letter, the list is shortened to show only the matching functions. To have Excel autocomplete an entry in that list, use the navigation keys to highlight the entry, and then press Tab*

Entering Formulas

- *Every formula must begin with an equal sign to inform Excel that the cell contains a formula rather than text*
- *Excel provides two ways to enter a formula into a cell: manually, or by pointing to cell references*
- *The Formula AutoComplete feature makes entering formulas easier than ever*

Entering Formulas

- *Every formula must begin with an equal sign to inform Excel that the cell contains a formula rather than text*
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Entering Formulas

Formula AutoComplete includes the following items:

- Excel built-in functions*
- User-defined functions (functions defined by the user through VBA or other methods)*
- Defined names (cells or range named using the Formulas □ Defined Names □ Define Name command)*
- Enumerated arguments that use a value to represent an option (only a few functions use such arguments, and AGGREGATE is one of them)*
- Table structure references (used to identify portions of a table)*

Using Cell Reference

Even though you can enter references by typing in the entire formula, Excel provides another method of entering the same that is generally easier, faster, and less error prone.

To enter the formula =SUM(A1+A2) into cell A3, follow these steps:

- 1. Move the cell pointer to cell A3.*
- 2. Type an equal sign (=SUM) to begin the formula*
- 3. Press the up arrow twice. As you press this key, Excel displays a moving border around cell A1, and the cell reference appears in cell A3 and in the Formula bar*
- 4. Type a plus sign (+). A solid color border replaces the faint border*
- 5. Press the up arrow again. The moving border encompasses cell A2 and adds that cell address to the formula.*
- 6. Press Enter to end the formula.*

Formulas for Tables

Pasting range names into formulas

- *If your formula uses named cells or ranges, you can either type the name in place of the address, or choose the name from a list and have Excel insert the name for you automatically.*

Formulas for Tables

Two ways to insert a name into a formula are available:

- *Select the name from the drop-down list. To use this method, you must know at least the first character of the name. When you're entering the formula, type the first character and then select the name from the drop-down list.*
- *Press F3. The Paste Name dialog box appears. Select the name from the list and then click OK (or just double-click the name). Excel enters the name into your formula.*

Common Errors

- *All arguments not provided*
- *Separators (commas) placed incorrectly*
- *Required number of brackets not closed*
- *Relative References added where an absolute reference may be required*

Advanced Naming Technique

- *Using range names can make your formulas easier to understand and modify and even help prevent errors. Dealing with a meaningful name such as AnnualSales is much easier than dealing with a range reference, such as AB12:AB68*
- *You can give a name to an item that doesn't appear in a cell. For example, if formulas in your worksheet use a sales tax rate, you would probably insert the tax rate value into a cell and use this cell reference in your formulas. To make things easier, you would probably also name this cell something similar to SalesTax.*

Advanced Naming Technique

Choose Formulas ➞ Defined Names ➞ Define Name. The New Name dialog box appears.

- Enter the name (in this case, SalesTax) into the Name field.*
- Select a scope in which the name will be valid (either the entire workbook or a specific worksheet)*
- Click the Refers To text box, delete its contents, and replace the old contents with a value (such as .075).*
- Click OK to close the New Name dialog box and create the name.*

Advanced Naming Technique

Choose Formulas ➞ Defined Names ➞ Define Name. The New Name dialog box appears.

- Type =SalesTax into a cell, this simple formula returns 0.075 — the constant that you defined. You can also use this constant in a formula, such as =A1*SalesTax.*

Advanced Naming Technique

- *In addition to creating named constants, you can also create named formulas. Like named constants, named formulas don't appear in the worksheet. You create named formulas the same way you create named constants — by using the New Name dialog box.*
- *To create a named formula that calculates the monthly interest rate from an annual rate. In this case, the name MonthlyRate refers to the following formula: =Sheet3!\$B\$1/12*
- *When you use the name MonthlyRate in a formula, it uses the value in B1 divided by 12.*