MS Excel Functions

What are Functions?

Functions are predefined formulas that perform calculations by using specific values, called arguments, in a particular order, or structure.

Argument: Arguments are the values that a function uses to perform operations or calculations.

What is a Formula?

A formula is a sequence of values, cell references, names, functions, or operators in a cell that together produce a new value.

Note: In Microsoft Excel a formula always begins with an equal sign (=).

Mathematical Functions:

SUM: This function adds all the numbers in a range of cells.
    Syntax: SUM(number1, number2,…)
    Example: =SUM(A2:F2)

SUMSQ: This function returns the sum of the square of the arguments.
    Syntax: SUMSQ(number1, number2,…)
    Example: =SUMSQ(A2:F2)

PRODUCT: Multiplies all the numbers in a range of cells.
    Syntax: PRODUCT(number1, number2,…)
    Example: =PRODCT(B2:B6)

ROUND: This function rounds a number to a specified number of digits.
    Syntax: ROUND(number, num_digits)
    Example 1:   =ROUND(45.5323,2) → 45.53
    Example 2:   =ROUND(45.5872,2) → 45.59

INT: The function rounds a number down to the nearest integer. Number is the real number.
    Syntax: INT(number)
    Example: =INT(4.6) → 4

FACT: It returns the factorial of a given number.
    Syntax: FACT(number)
    Example: =FACT(5) → Equal to 1*2*3*4*5 → 120

ABS: It returns the absolute value of a number (a number without its sign).
    Syntax: ABS(number)
    Example 1:   =ABS(-25) → 25
    Example 2:   =ABS(A1-B1)

SQRT: It returns the square root of a given number.
Syntax: SQRT(number)
Example 1:   =SQRT(81) → 9
Example 2:   =SQRT(A3)

POWER: It returns the result of a number raised to a power.
Syntax: POWER(number, power)
Example 1:   =POWER(5,2) → 25
Example 2:   =POWER(A1,A2)

Statistical Functions:

COUNT: It counts the number of cells that contain numbers and also counts numbers
within the list of arguments.
Syntax: COUNT(value1, value2, …)
Example 1:   =COUNT(3,45, "Ali",74) → 3
Example 2:   =COUNT(A1:A5)

COUNTA: It counts the number of cells that are not empty and it also counts the
values within the list of arguments. The COUNT function counts only
numbers while COUNTA function counts value of any type of information.
Syntax: COUNTA(value1, value2, …)
Example 1:   =COUNTA(3,45, "Ali",74) → 4
Example 2:   =COUNTA(A1:A5)

COUNTBLANK: This function counts the number of empty cells in a range of cells.
Syntax: COUNTBLANK(range)
Example: =COUNTBLANK(A1:G1)

AVERAGE: This function returns the average of its arguments.
Syntax: AVERAGE(number1, number2, …)
Example 1:   =AVERAGE(45,55,50) → 50
Example 2:   =AVERAGE(A1:A6)

MAX: This function returns the largest value in a set of values.
Syntax: MAX(number1, number2, …)
Example 1:   =MAX(45,85,25) → 85
Example 2:   =MAX(G2:G6)

MIN: This function returns the smallest value in a set of values.
Syntax: MIN(number1, number2, …)
Example 1:   =MIN(45,85,25) → 25
Example 2:   =MIN(G2:G6)

Date And Time Functions:

DATE: It returns the number that represents the date in Microsoft Excel date-time
code.
Syntax: DATE(year,month,day)
Example: =DATE(2007,4,23)

NOW: It returns the current date and time formatted as date and time. This function takes no arguments. Just type NOW() and press enter.
    Syntax: NOW()
    Example: =NOW()

TODAY: This function returns the current date formatted as date. This function also takes no arguments.
    Syntax: TODAY()
    Example: =TODAY()

TIME: This function converts hours, minutes, and seconds given as numbers to an Excel serial number, formatted with a time format.
    Syntax: TIME(hour,minute,second)
    Example: =TIME(5,45,40)

Text Functions:

LEFT: It returns the specified number of characters from the start of a text string.
    Syntax: LEFT(text,num_chars)
    Example 1: =LEFT("Ali Khan",3) → Ali
    Example 2: =LEFT(A2,3)

RIGHT: It returns the specified number of characters from the end of a text string.
    Syntax: RIGHT(text,num_chars)
    Example 1: =RIGHT("Ali Khan",4) → Khan
    Example 2: =RIGHT(A2,2)

MID: It returns the specified number of characters from the middle of a text string (a starting position is also given).
    Syntax: MID(text,start_num,num_chars)
    Example 1: =MID("Shahid Ali Khan",8,3) → Ali
    Example 2: =MID(A2,4,2)

LOWER: This function converts all letters in a text string to lowercase.
    Syntax: LOWER(text)
    Example 1: =LOWER("ALI") → ali
    Example 2: =LOWER(A2)

UPPER: This function converts all letters in a text string to uppercase.
    Syntax: UPPER(text)
    Example 1: =UPPER("ali") → ALI
    Example 2: =UPPER(A2)

LEN: It returns the number of characters in a text sting.
    Syntax: LEN(text)
    Example 1: =LEN("Shahid Ali") → 10 (The text includes 1 space.)
    Example 2: =LEN(A2)

EXACT: This function checks whether two text strings are exactly the same or not. It returns FALSE if they are not exactly the same and returns TRUE if they are exactly the same.

Note: It is case-sensitive.
Syntax: EXACT(text1,text2)
Example 1:   =EXACT("ali","Ali") → FALSE
Example 2:   =EXACT("Ali","Ali") → TRUE
Example 3:   =EXACT(A2,B2)

CHAR: It returns the character specified by the code number.
Syntax: CHAR(number)
Example 1:   =CHAR(65) → A
Example 2:   =CHAR(97) → a
Example 3:   =CHAR(A2)

CODE: It returns a numeric code for the first character in a text string.
Syntax: CODE(text)
Example 1:   =CODE("a") → 97
Example 2:   =CODE("A") → 65
Example 3:   =CODE(B2)

CONCATENATE: This function joins several text string into one text string.
Syntax: CONCATENATE(text1,text2,…)
Example 1:   =CONCATENATE("Ali"," Khan") → Ali Khan
Example 2:   =CONCATENATE("Shahid"," Ali ","Khan") → Shahid Ali Khan
Example 3:   =CONCATENATE(A2,A3,A4)

REPT: It repeats text for specified number of time.
Syntax: REPT(text,num_times)
Example 1:   =REPT("Ali ",3) → Ali Ali Ali
Example 2:   =REPT(B2,4)

TRIM: This function removes all the spaces from a text string except single space between words.
Syntax: TRIM(text)
Example 1:   =TRIM("Shahid   Ali   Khan") → Shahid Ali Khan
Example 2:   =TRIM(A5)

Logical Functions:

IF: It checks whether a condition is TRUE or FALSE, and returns one value if it is TRUE, and another value if it is FALSE.
Syntax: IF(logical_test,value_if_true,value_if_false)
Example: =IF(F2>=40,"Passed","Failed")
An Example of Nested IF Function:
=IF(F2>=80,"A1",IF(F2>=70,"A",IF(F2>=60,"B",IF(F2>=50,"C",IF(F2>=40,"D","Failed")))))

TRUE: It returns the logical value TRUE. It takes no arguments.
Syntax: TRUE()
Example: =TRUE() → TRUE

FALSE: It returns the logical value FALSE. Like TRUE() function it also takes no arguments.
Syntax: FALSE()
Example: =FALSE() → FALSE

AND: It returns TRUE if all arguments are TRUE.
Syntax: AND(logical1,logical2,…)
Example 1:   =AND(A1>=50,A2>=50)
Example 2:   =IF(AND(B2>=40,C2>=40,D2>=40),"Passed","Failed")

OR: It checks whether any of the arguments are TRUE. It returns FALSE only if all arguments are FALSE.
Syntax: OR(logical1,logical2,…)
Example 1:   =OR(A1>=40,B1>=40)
Example 2:   =IF(OR(B2<40,C2<40,D2<40),"Failed","Passed")

NOT: It reverses the value of its arguments.
Syntax: NOT(logical)
If *logical* is FALSE, it returns TRUE; if *logical* is TRUE, it returns FALSE.
Example 1:   =NOT(A1>=50)
Example 2:   =IF(NOT(F2>=40),"Failed","Passed")