Date _____

Expt. No. _____ Page No. 01.

PART-A : Spreadsheet (Excel)

Data preprocessing, interpretation and analytical functions

✱ Data Set :

	A	B	C	D	E	F	G	H
1	Subject - Wise Workload dataset							
2	Coll ID	Coll Name	Subject	Full WL	Partial WL	Total WL	WL Type	Concatenate Coll ID
3	299	AKCW299	Python	1	0			
4	4	AKCW4	Chemistry	1	0			
5								
6								
7								
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
40	23	AKCW23	Business	2	1			

A). Conditional Formatting :

	D	E
2	Full WL	Partial WL
3	1	0
4	1	0
5	1	1
6	4	1
7	7	0
⋮	⋮	⋮
40	2	1

Date

Expt. No. 01.

Page No. 02.

01) Demonstrate Conditional Formatting, IF(), COUNTIF(), SUMIF(), AVERAGE(), CONCATENATE()

Soln:- To demonstrate the above mentioned functionalities, we have considered, "Subject wise workload" Sample dataset. This dataset is having 38 Rows and 7 Columns. They are,

- → Coll ID
- → Coll Name
- → Full Workload
- → Partial Workload
- → Total Workload
- → Workload Type
- → Concatenate Coll ID and Coll Name

A) Conditional Formatting :

Conditional formatting is used to change the appearance of cells in a range based on your specified conditions.

→ In the considered dataset, Conditional formatting is applied on Full workload (Col D) and partial workload (Col E) columns.

Step 1 : Select Col 'D' and Col 'E' data Columns.

Step 2 : Go to home Tab → Style Group → Conditional formatting options, click it.

Step 3 : From the dropdown, click on the rule you wish to apply highlight the cell → Greater than Condition is "Greater than" > 5.

Step 4 : Changes are reflected on Col 'D' and Col 'E'.

Horizon

Teacher's Signature

B) IF() Function :

	A	B	C	D	E	F	G	H
2	Coll ID	Coll Name	Subject	Full WL	Partial WL	Total WL	WL Type	Concatenate Coll ID
3	299	AKCW299	Python	1	0	1	full + Partial	
4	4	AKCW4	Chemistry	1	0	1	full + Partial	
5			Python	1	1	2	Only full	
6								
7								
40	23	AKCW23	Business	2	1	3	Only full	

C) COUNTIF() function :

1. Number of College offering each subject using COUNTIF().

	J	K	L
16	SL NO	Name	No.of.College
17	1	Chemistry	3
18	2	Python	4
19	3	Business	2

Date

Expt. No. 01.

Page No. 03.

B) IF() Function :

The IF() function is a predefined function in Excel, which returns values based on true or false.

This function is applied on col 'G' -> for finding the workload Type (WL Type).

Syntax :=IF(logical_test, [value_if_true], [value_if_false])

Where, • logical_test = Condition.
• Value_if_true = Statement display if Condition is true.
• Value_if_false = Statement display if Condition is false.

Example :=IF(E3:E40, "Only Full", "Full + Partial")

C) COUNTIF() Function :

The COUNTIF() function in Excel Counts the number of cells within a range based on Pre-defined Criteria.

Syntax :=COUNTIF (range, criteria)

where, • range = define 1 or more cells to Count.
• Criteria = The Condition that tells the function, which cells to Count.

Horizon

Teacher's Signature

D) SUMIF() function :

	F	K
2	Total WL	SUMIF
3	1	2
4	1	17
5	2	0
6	5	12
7	7	19
⋮	⋮	⋮
40	3	4

E) AVERAGE() function :

	D	E	L
2	Full WL	Partial WL	AVerage()
3	1	0	0.5
4	1	0	2.5
5	1	1	1
6	4	1	3.5
7	7	0	
⋮	⋮	⋮	⋮
40	2	1	

Date

Expt. No. 01 Page No. 04.

Example :-=COUNTIF(C3:C40, 14:16)

D) SUMIF() Function :

The SUMIF() is a pre-defined function in Excel, which calculates the sum of values in a range based on a True or false condition.

Syntax :-=SUMIF(range, criteria, [Sum_range])

Where, • range = range of data to apply SUMIF()
• Criteria = which can check thing like =, <, >
• [Sum_range] = The range where the function calculates the sum.

Example :-
=SUMIF(F3:F40, "<2")
=SUMIF(F3:F40, ">1"), =SUMIF(F3:F40, "<=2")

E) AVERAGE() Function :

The AVERAGE() function is a premade function in Excel, which calculates the average (arithmetic mean).
It adds the range and divides it by the number of observations.

Syntax :-=AVERAGE(number1, [number2], ...)

Example :-=AVERAGE(D3, E3), =AVERAGE(D6, E6), =AVERAGE(D5, E5), =AVERAGE(D7, E7)

Horizon Teacher's Signature

F) CONCATENATE() Function:

	A	B	C	D	E	F	G	H
2	Coll ID	Coll Name	Subject	Full WL	Partial WL	Total WL	WL Type	Concatenate() Coll ID & WL TYPE
3	299	AKCW299	Python	1	0	1	Full + Partial	299/Full+ Partial
4	4	AKCW4	Chemistry	1	0	1	Full + Partial	4/Full+ Partial
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
40	23	AKCW23	Business	2	1	3	Only full	23/Only full

Date

Expt. No. 01

Page No. 05.

F) CONCATENATE() function :

The concatenate is just another way of saying "to combine" or "to join together".

Syntax :- =Concatenate (text 1, [text 2], ...)

where, • text 1 = The first item to join (text, Value, number, Cell reference).

• text 2 = Combine with text 1

Example :- =CONCATENATE (A3, "/", G3)
=CONCATENATE (A4, "/", G4)
=CONCATENATE (A40, "/", G40)

Horizon

Teacher's Signature

A) LEFT() Function :

	C	I
2	Subject	LEFT()
3	Python	Py
4	Chemistry	Chem

B) MID() Function :

	C	K
2	Subject	MID()
4	Chemistry	hemis
7	Python	thon

Date

Expt. No. 02. Page No. 06.

Q2) Demonstrate LEFT, MID, RIGHT, LEN, SUBSTITUTE, SEARCH, ISNUMBER.

A) LEFT() Function :

The 'LEFT' function is used to extract a specified number of characters from the beginning (left side) of a text string.

Syntax :

=LEFT(text, num_chars)

where, • text : This is the text string from which you want to extract characters.

• num_chars : This is the number of characters you want to extract from the left side of the text.

Example :- =LEFT(C3, 2), =LEFT(C4, 4)

B) MID() Function :

The MID() function is used to extract a specific number of characters from a text string, starting at a specified position.

Syntax :- =MID(text, Start_num, num_chars)

where, • text : This is the text string from which you want to extract characters.

• Start_num : This is the starting position in the text string from which you want to begin extraction.

• num_chars : This is the number of characters you want to extract.

Example :- =MID(C4, 2, 5), =MID(C7, 3, 5)

Horizon

Teacher's Signature

C) RIGHT() Function :

	C	J
2	Subject	RIGHT()
3	Python	on
4	Chemistry	stry

D) LEN() Function :

	C	L
2	Subject	LEN()
3	Python	6
4	Chemistry	9

Date

Expt. No. 02. Page No. 07

C) RIGHT() Function :

The 'RIGHT()' function in Excel is used to extract a specified number of characters from the right side of a text string.

Syntax :- =RIGHT(text, num_chars)

Where, • text = The text string you want to extract from,

• num_chars = is the number of characters you want to retrieve from the right end of the text.

Example :- =RIGHT(C3,2) , =RIGHT(C4,4)

D) LEN() Function :

The 'LEN()' Function in Excel is used to count the number of characters in a text string.

Syntax :- =LEN(text)

Where., • text = The text string for which you want to determine the length.

Example :- =LEN(C3) , =LEN(C4)

E) SUBSTITUTE() Function :

The 'SUBSTITUTE()' function is used to replace occurrences of a specified substring with another substring in a given text string.

Syntax :- =SUBSTITUTE(text, old_text, new_text, [instance_num])

Horizon

Teacher's Signature

E) SUBSTITUTE() Function :

	C	M
2	Subject	SUBSTITUTE()
6	Computer sci	Computer applications
3	Python	java

F) SEARCH() Function :

	C	N
2	Subject	SEARCH()
3	Python	2
4	Chemistry	4

Date

Expt. No. 02. Page No. 08.

where., • text = The original text string where you want to replace occurrences.
• old_text = The substring you want to replace.
• new_text = The new substring that will replace 'old_text'.
• [instance_num] = (optional) : Specifies which occurrence of 'old text' to replace.

Example : =SUBSTITUTE(C6, "sci", "applications")
=SUBSTITUTE(C3, "Python", "java")

F) SEARCH() Function :

SEARCH() will return the position of a specified character or sub-string within a supplied text string.

Syntax : =SEARCH(find_text, within_text, [start_num])

where., • find_text = The text you want to find.
• within_text = The text containing the data you want to search.
• [Start_num] = (optional) : The starting number for the search within the 'within_text'.

Example : =SEARCH("m", C4), =SEARCH("y", C3)

G) ISNUMBER() FUNCTION :

The 'ISNUMBER()' function is used to check if a cell contains a numeric Value.

Horizon

Teacher's Signature

6) ISNUMBER() Function :

	A	C	O
2	CollID	Subject	ISNUMBER()
3	299		TRUE
5		Python	FALSE

Date

Expt. No. 02

Page No. 09

It returns TRUE if the cell's content is a number and FALSE if it is not.

Syntax : =ISNUMBER(Value)

Where., • Value = The Value or cell reference you want to check.

Example : =ISNUMBER(A3)
=ISNUMBER(C5)

Horizon

Teacher's Signature

A) TODAY() Function :

= TODAY()

· 17-12-2023

B) NOW() Function :

= NOW()

· 17-12-23 19:24

C) YEAR() Function :

= YEAR(Serial_number)

= YEAR("17-Dec-23")

· 2023

Date

Expt. No. 03. Page No. 10.

03) Demonstrate TODAY, NOW, YEAR, MONTH, NETWORKDAYS, EOMONTH

A) TODAY() Function :

In Excel, the 'TODAY()' function returns the current date.

Syntax : =TODAY()

Where, 'TODAY()' in a cell, it will display the current date. This date will automatically update every time you open or recalculate the spreadsheet.

Example : =TODAY()

B) NOW() Function :

In Excel, the 'NOW()' function is used to return the current date and time.

Syntax : =NOW()

Simply enter this formula in a cell, and it will display the current date and time.

Example : =NOW()

C) YEAR() Function :

The 'YEAR()' function is used to extract the year from a date.

Syntax : =YEAR(Serial_number)

where., Serial_number : This is the date from which you want to extract the Year.

Example :- =YEAR("17-Dec-23")

Horizon

Teacher's Signature

D) MONTH() Function :

= MONTH("17-Dec-23")

. 12

E) NETWORKDAYS() Function :

= NETWORKDAYS("2-oct-23", "31-dec-23")

. 65

= NETWORKDAYS("2-oct-23", "31-dec-23", "01-NOV-23": "25-Dec-23")

. 63

Expt. No. 03. Page No. 11 Date

D) MONTH() Function :

The 'MONTH()' function is used to extract the month from a date.

Syntax :- =MONTH(serial_number)

where., • Serial_number : This is the date from which you want to extract the month.

Example : =MONTH("17-Dec-23")

E) NETWORKDAYS() Function :

The 'NETWORKDAYS()' function is used to calculate the number of whole workdays (Monday through Friday) between two dates, excluding specified holidays.

Syntax : =NETWORKDAYS(start_date, end_date, [holidays])

where., start_date : The start date of the period.

end_date : The end-date of the Period.

[holidays] : Optional Parameter where you can specify a range of cells containing holiday dates.

Example : =NETWORKDAYS("2-oct-23", "31-dec-23")

=NETWORKDAYS("2-oct-23", "31-dec-23", "01-NOV-23": "25-Dec-23")

F) EOMONTH() Function :

The 'EOMONTH()' function in Excel returns the serial number for the last day of the month that is a specified number of months

Horizon

Teacher's Signature

F) EOMONTH() Function :

	A	B
1	Start date	EOMONTH()
2	26-Jan-16	42429
3	1-Apr-23	45169
4	18-Aug-23	45138
5	10-Nov-23	45199

* After Converting Cell B Values to Date format :

	A	B
1	Start date	EOMONTH()
2	26-Jan-16	29-02-16
3	1-Apr-23	31-08-23
4	18-Aug-23	31-07-23
5	10-Nov-23	30-09-2023

Date

Expt. No. 03. Page No. 12

before or after a specified date.

Syntax :- =EOMONTH(Start_date, months)

where, Start_date : The initial date.

months : The number of months before or after the start_date.

A positive value for months yields a future date, & a negative value yields a Past date.

Example : =EOMONTH(A2, 1), =EOMONTH(A3, 4)
=EOMONTH(A4, -1), =EOMONTH(A5, -2)

=> STEPS TO CONVERT A VALUES TO DATE FORMAT :-

1) Step 1 : Once you get your values, Right click on the particular cell.
2) Step 2 : Click on Format Cell.
3) Step 3 : Under the Category cell, Select as Date.
4) Step 4 : Then, select the type of format you want. for example, DD-MM-YY or YY-MM-DD.
5) Step 5 : Click on OK. Then you will be getting the Date format.

Horizon

Teacher's Signature

A) VLOOKUP() Function :

A	B	C	E	F
Name	Date	Value		VLOOKUP
a	01-01-2022	1	C	3
b	26-01-2022	2		
c	22-02-2022	3		
d	23-02-2022	4		
e	11-03-2022	5		
f	14-03-2023	6		
g	25-03-2023	7		
h	28-03-2023	8		

B) HLOOKUP() Function :

A	B	C	E	F
Name	Date	Value		HLOOKUP
a	01-01-2022	1		
b	26-01-2022	2	Date	14-03-2023
c	22-02-2022	3		
d	23-02-2022	4		
e	11-03-2022	5		
f	14-03-2023	6		
g	25-03-2023	7		
h	28-03-2023	8		

Date

Expt. No. 04. Page No. 13

04) Demonstrate VLOOKUP, HLOOKUP, XLOOKUP, COUNT, COUNTA.

A) VLOOKUP() Function :

Looks for a value in the leftmost column of a table, and then return a value in the same row from a column you specify.

Syntax : =VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])

Example : =VLOOKUP(E44, A43:C51, 3, FALSE)

B) HLOOKUP() Function :

Looks for a value in the top row or array of values and returns the value in the same column from a row you specify.

Syntax : =HLOOKUP(lookup_value, table_array, row_index_num, [range_lookup])

Example : =HLOOKUP(E45, A43:C51, 7, FALSE)

Horizon

Teacher's Signature

c) XLOOKUP() Function :

	C	D	E	F
43	Value	Value		XLOOKUP
44	1	56		14-03-2023
45	2	22		
46	3	13	88	11-03-2022
47	4	14	62	
48	5	66		
49	6	102		
50	7	36		
51	8	1		

D) COUNT() E) COUNTA()

	A	C	G	H
43	Name	Value	COUNT	COUNTA
44	a	1	8	9
45	b	2		
46	c	3	0	9
47	d	4		
48	e	5		
49	f	6		
50	g	7		
51	h	8		

Date

Expt. No. 04. Page No. 14

c) XLOOKUP() Function :

Searches a range or an array for a match and returns the corresponding item from a second range or array, by default, an exact match is used.

Syntax : =XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])

Example : =XLOOKUP(E46, D43:D51, B43:B51, "NOT FOUND", 1, 1)

= XLOOKUP(E47, D43:D51, B43:B51, "NOT FOUND", 1, 1)

D) COUNT() Function :

Counts the number of cells in a range that contain numbers

Syntax : =COUNT(Value 1, [Value 2], ...)

Example : =COUNT(C43:C51)

= COUNT(A43:A51)

E) COUNTA() Function :

Counts the number of cells in a range that are not empty.

Syntax : =COUNTA(Value 1, [Value 2], ...)

Example : =COUNTA(C43:C51)

= COUNTA(A43:A51)

Horizon

Teacher's Signature

A) INDEX() Function :

	A	B	C	D	E
1		1	2	3	Index
2	1	name	Height	Weight	
3	2	Sally	6.2	185	5.8
4	3	tom	5.9	170	210
5	4	Kevin	5.8	175	
6	5	Amanda	5.5	145	
7	6	Carl	6.1	210	
8	7	Ned	6	180	

B) MATCH() Function :

	A	B	C	D	F	G
1		1	2	3	Match	
2	1	name	Height	Weight		
3	2	Sally	6.2	185	7	Exact match
4	3	Tom	5.9	170	1	Greater Value
5	4	Kevin	5.8	175	4	Lesser Value
6	5	Amanda	5.5	145		
7	6	Carl	6.1	210		
8	7	Ned	6	220		

Expt. No. 05. Date

Page No. 15.

05 Demonstrate INDEX, MATCH, UNIQUE, COUNTIFS, SUMIFS, AVERAGEIFS.

A) INDEX() Function :

The INDEX() function returns a value or the reference to a value from within a table or range.

Syntax : =INDEX(array, row_num, [column_num])

Example : =INDEX(B2:D8, 4, 2)
=INDEX(B2:D8, 6, 3)

B) MATCH() Function :

The MATCH() Function searches for a specified item in a range of cells, and then returns the relative position of that item in the range.

Syntax : =MATCH(lookup_value, lookup_array, [match_type])

Example : =MATCH(B8, B2:B8, 0)
=MATCH(175, D3:D8, -1)
=MATCH(180, D3:D8, 1)

C) UNIQUE() Function :

The UNIQUE() function in Excel returns a list of unique values from a range or array.

Horizon

Teacher's Signature

C) UNIQUE() Function :

	A	B	G
1		1	4
2	1	name	unique
3	2	Sally	Sally
4	3	tom	tom
5	4	Kevin	Kevin
6	5	Amanda	Amanda
7	6	Carl	Carl
8	7	ned	ned
9	8	Kevin	
10	9	Amanda	
11	10	Carl	
12	11	tom	
13	12	Sally	
14	13	ned	
15	14	Carl	

Expt. No. 05. Date

Page No. 16

Syntax : =UNIQUE(array, [by_col], [exactly_once])

Example : =UNIQUE(B3:B15)

D) COUNTIFS() Function :

The COUNTIFS() Function is a premade function in Excel, which counts cells in a range based on one or more true or false condition.

Syntax : =COUNTIFS(criteria_range1, Criteria1, [criteria_range2, criteria2],...)

Example : =COUNTIFS(B3:B15, "Carl", C3:C15, "=5", D3:D15, ">100")

Horizon

Teacher's Signature

D) COUNTIFS() function :

	A	B	C	D	F
1		1	2	3	
2	1	name	height	Weight	Countifs
3	2	Sally	6.2	185	
4	3	tom	5.9	170	2
5	4	Kevin	5.8	175	
6	5	Amanda	5.5	145	
7	6	Carl	6.1	210	
8	7	ned	6	220	
9	8	Kevin	5.8	175	
10	9	Amanda	6	180	
11	10	Carl	5	165	
12	11	tom	5.1	145	
13	12	Sally	5.3	150	
14	13	ned	5	190	
15	14	Carl	5	110	

Expt. No. 05. Date

Page No. 17

E) SUMIFS() Function :

The SUMIFS() Function, adds all of its arguments that meet multiple criteria.

Syntax : =SUMIFS(sum_range, criteria_range1, criteria1, [criteria_range2, criteria2], ...)

Example : =SUMIFS(D3:D15, B3:B15, "Carl", C3:C15, "=5")

Horizon

Teacher's Signature

E) SUMIFS()

F) AVERAGEIFS()

▲	A	B	C	D	E	F
1		1	2	3		
2	1	name	height	weight	Sumifs	Averageifs
3	2	Sally	6.2	185		
4	3	tom	5.9	170	275	161.6667
5	4	Kevin	5.8	175		
6	5	Amanda	5.5	145		
7	6	Carl	6.1	210		
8	7	ned	6	220		
9	8	Kevin	5.8	175		
10	9	Amanda	6	180		
11	10	Carl	5	165		
12	11	tom	5.1	145		
13	12	Sally	5.3	150		
14	13	ned	5	190		
15	14	Carl	5	110		

Date

Expt. No. 05. Page No. 18

F) AVERAGEIFS() Function :

The Averageifs function, which calculates the average of a range based on one or more true or false condition.

Syntax : =AVERAGEIFS(average_range, criteria_range1, criteria1, ...)

Example : =AVERAGEIFS(D3:D15, B3:B15, "Carl", D3:D15, ">0")

Horizon

Teacher's Signature