

SECTION A [40 MARKS]
ANSWER ALL QUESTIONS

Question 1

a) **Direction: For each question, there are FOUR responses: A, B, C and D. Choose the corresponding letter of your response and CIRCLE it neatly. NO score will be awarded if you circle more than one.**

[30]

i. A teacher wants to ensure that student test scores entered into an Excel spreadsheet are valid whole numbers between 1 and 100. Which feature should the teacher use in Excel?

- A Filter
- B Pivot Table
- C Data Validation
- D Conditional Formatting

ii. A software development company is looking to streamline its operations by focusing solely on developing and running applications without having to manage the underlying hardware or software updates. Which cloud service model should they choose to best suit their needs?

- A Infrastructure as a Service (IaaS).
- B Software as a Service (SaaS).
- C Function as a Service (FaaS).
- D Platform as a Service (PaaS).

iii. What formula should be used in cell E2 to calculate the total sales for Monday?

	A	B	C	D	E
1	Day	Product	Units Sold	Unit Price(Nu)	Total Sales(Nu)
2	Monday	A	10	5.00	
3	Tuesday	B	8	7.50	
4	Wednesday	A	15	12.00	
5	Thursday	C	5	7.50	

- A = B2 * D2
- B = C2 * D2
- C = B2 * C2 * D2
- D = SUM(C2 : D2)

- iv. Mr. Penjor wants to create a program that prints all the even numbers from 1 to 15 for his ICT class. Which of the following `for` loop statements should he use to achieve this task effectively?

A

Line	Code
1	<code>for i in range(1,15):</code>
2	<code> if i % 2 == 0:</code>
3	<code> print(i)</code>

B

Line	Code
1	<code>for i in range(1,16,2):</code>
2	<code> print(i)</code>

C

Line	Code
1	<code>for i in range(2,14,2):</code>
2	<code> print(i)</code>

D

Line	Code
1	<code>for i in range(0,15):</code>
2	<code> if i % 2 == 0:</code>
3	<code> print(i)</code>

- v. Mrs. Pema Wangmo is writing a research paper on the psychological effects of social media on teenagers. She found a book titled "The Digital Age: Psychological Impacts of Social Media," written by Dr. Jane Smith, published in 2021 by HarperCollins Publishers. She want to cite this book in APA format. Which of the following is the correct APA citation for the book?
- A Smith, J. (2021). The Digital Age: Psychological Impacts of Social Media. HarperCollins Publishers.
 - B Smith, J. (2021). The digital age: psychological impacts of social media. HarperCollins Publishers.
 - C Smith, J. (2021). The Digital Age: Psychological Impacts of Social Media. New York: HarperCollins Publishers.
 - D Smith, J. (2021). The digital age: psychological impacts of social media. New York: HarperCollins Publishers.
- vi. Which logical function in Excel would you use to reverse the logical value of its argument?
- A AND
 - B NOT
 - C OR
 - D IF
- vii. Given a situation where you need to execute a block of code for a specific number of times, which type of loop is most appropriate to use?
- A do-while loop
 - B if statement
 - C while loop
 - D for loop

- viii. You, a teacher using Google Workspace for Education, want to create a collaborative project for your students where they can simultaneously work on a presentation. Which of the following Google Workspace tools is the most appropriate for this task, and what steps would you take to set it up?
- A Google Forms: Create a new form, share it with students, and have them input their contributions in the form fields.
 - B Google Docs: Create a new document, share it with students, and have them add their content in different sections.
 - C Google Sheets: Create a new spreadsheet, share it with students, and assign different rows or columns for their input.
 - D Google Slides: Create a new slide deck, share it with students, and assign different slides to each student for their contributions.
- ix. You are assigned to create a shape using Python's Turtle graphics. Based on the provided code snippet, which shape will be produced by given code?

Line	Code
1	<code>import turtle</code>
2	<code>t = turtle.Turtle()</code>
3	<code>for _ in range(6):</code>
4	<code> t.forward(100)</code>
5	<code> t.right(60)</code>
6	<code>turtle.done()</code>

- A Square
- B Octagon
- C Pentagon
- D Hexagon

- x. As a content creator preparing to publish your artwork online, demonstrate your understanding of creative commons licenses by identifying the statement that accurately describes a creative commons license.
- A Creative commons licenses prohibit any use of your artwork without explicit permission from you.
 - B Creative commons licenses allow others to use, share, and adapt your artwork under specific conditions determined by you.
 - C Creative commons licenses automatically transfer full ownership of your artwork to the public domain.
 - D Creative commons licenses apply only to non-commercial uses of your artwork, excluding any commercial exploitation.

xi. What will be the correct output from the following sample code?

Line	Code
1	<code>my_list = ["Range", 'function', 'inbuilt', 'variable']</code>
2	<code>my_list.pop(2)</code>
3	<code>print(my_list)</code>

- A ['Range', 'function', 'inbuilt', 'variable']
 - B ['Range', 'inbuilt', 'variable']
 - C ['Range', 'function', 'inbuilt']
 - D ['Range', 'function', 'variable']
- xii. Which of the following names adheres to Python's rules for valid variable names?
- A school – 1
 - B school_1
 - C school 1
 - D 1school

xiii. Given the tuple, `my_tuple = (10,20,30,40)`, what is the result of `my_tuple[1]`?

- A 10
- B 20
- C 30
- D 40

xiv. Which of the following Python functions, correctly calculates the profit given the cost price (CP) and selling price (SP) of an item?

A

Line	Code
1	<code>def calculate_profit(cp, sp):</code>
2	<code> profit = cp - sp</code>
3	<code> return profit</code>
4	<code>print(calculate_profit(50, 70))</code>

B

Line	Code
1	<code>def calculate_profit(cp, sp):</code>
2	<code> return cp * sp</code>
3	<code>print(calculate_profit(50, 70))</code>

C

Line	Code
1	<code>def calculate_profit(cp, sp):</code>
2	<code> profit = cp + sp</code>
3	<code> return profit</code>
4	<code>print(calculate_profit(50, 70))</code>

D

Line	Code
1	def calculate_profit(cp, sp):
2	profit = sp - cp
3	return profit
4	print(calculate_profit(50, 70))

- xv. Consider the following table that shows the information about employees, their departments, and their salaries.

	A	B	C
1	Employee	Department	Salary
2	Sonam	HR	50000
3	Rinzin	IT	60000
4	Renuka	HR	55000
5	Pema	IT	62000
6	Ashis	Marketing	48000

Which of the following formulas will give the total salary for employees in the IT department?

- A =SUMIF(A2:A6, "IT", C2:C6)
 B =SUMIF(A2:A6, "IT", B2:B6)
 C =SUMIF(B2:B6, "IT", B2:B6)
 D =SUMIF(B2:B6, "IT", C2:C6)

b) Complete the following statements with the most appropriate word.

[5]

i. In Python, an ordered collection of items which is changeable and allows duplicate members is a _____.
ii. Acknowledging ownership of intellectual property by citing sources is crucial to avoid _____.
iii. The exclusive legal right given to an originator or an assignee to print, publish, perform, film, or record literary, artistic, or musical material, and to authorize others to do the same is called _____.
iv. The data structure used to store key-value pairs, where each key is unique, is called a _____.
v. If Mr. Sonam Wangchuk wants to encapsulate code for reuse and perform a specific task, he would define a _____ in Python.

c) State whether the following statements are TRUE or FALSE in the space provided.

[5]

Statements	True/False	
i. Google Docs allows multiple users to edit a document simultaneously and provides real-time updates to all collaborators.		
ii. Mr. Raju is working on data structures in Python. He wants to ensure that a collection of elements contains no duplicates, and the order of elements does not matter. He should use a Python set.		
iii. Miss Yuden shared that consistently using vague variable names and avoiding comments to explain complex code helps improve code readability and maintainability.		
iv. A <code>while</code> loop in Python continues to execute as long as the specified condition is true.		
v. Creative Commons licenses allow creators to waive their copyright completely.		

SECTION B [60 MARKS]
ATTEMPT ALL THE QUESTIONS

Question 2

- a) A teacher uses MS Excel to analyse the test results of his students. The marks scored by each student are presented in the spreadsheet.

	A	B	C	D	E
1	Student Name	Math	Science	English	ICT
2	Pema	85	78	92	88
3	Dorji	90	84	76	94
4	Tshering	75	80	85	72
5	Yuden	88	92	90	86

- i. Write an Excel formula or function to find the highest score in ICT subject? [1]

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- ii. Write an Excel formula or function to find the average score across all subjects for Mr. Pema. [1]

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- b) Imagine a small retail business that currently uses traditional on-premises storage solutions to manage their inventory data, customer records, and financial documents. They are considering switching to cloud-based storage but are unsure how it would benefit them.

- i. How can switching to cloud-based storage help this retail business reduce its upfront hardware costs? [1]

- ii. What advantage does cloud-based storage offer this business in terms of adjusting storage capacity as their inventory data grows or during seasonal variations? [1]

- iii. In what way can cloud-based storage enhance the business's ability to recover data in case of hardware failure or other emergencies? [2]

c)

- i. Analyse the following function to debug and rewrite the correct code. [2]

Line	Code
1	<code>def add_numbers(a, b):</code>
2	<code> return a + b</code>
3	<code>print(add_numbers(5))</code>

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- ii. From the following function, what will be the output if you call function `mystery_function(5)`? Explain your answer. [2]

Line	Code
1	<code>def mystery_function(a):</code>
2	<code> return a*2+3</code>
3	<code>result=mystery_function(5)</code>
4	<code>print(result)</code>

Question 3

a)

- i. Describe how you would use Google Docs to collaborate on a group assignment. [1]

- ii. Explain the primary function of Google Drive in Google Workspace. [1]

- iii. Suggest **TWO** effectiveness of using Google Slide. [1]

- b)** Imagine you are part of a group project where you and your classmates are creating a digital presentation on the topic of online safety. During the project, one of your teammates suggests using images found on the internet without citing the source.

- i. Why is it important to cite sources when using images from the internet in academic projects? Mention **TWO** reasons. [1]

- ii. What ethical considerations should be taken into account when using content found online in educational materials? [1]

- iii. How could the team handle the situation to ensure both integrity and educational value in their presentation? [1]

c)

- i. Write a Python program using a `for` loop to calculate the sum of all integers from 1 to 50. Each number should be added to a cumulative total, and the final sum should be displayed. [2]

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- ii. Create a Python program using a `while` loop to generate numbers from 0 to 10. [2]

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Question 4

- a) Explain the difference between Copyright and Creative Commons licenses. How do they impact the use and distribution of creative works? [2]

- b) Mr. Dorji, a sales manager, wants to visually analyse the monthly sales data for his team to identify trends and patterns. He has recorded the sales figures for each month in an Excel spreadsheet. Which Excel feature should he use to create a graphical representation of the sales data, and how will this help him in his analysis? [2]

- c) Using Python Turtle and function to draw a square. [1]
i. Write code to define a function named `draw_square` in Python Turtle?

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- ii. Within the `draw_square` function, write the code to make the Turtle draw a square with each side of length 100 units. [1]

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- iii. Describe how you would call the `draw_square` function to execute the drawing. [1]

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- d) [1]

- i. What is a `set` in Python?

- ii. Which data structure `list` or `set` do you recommend, and why? Defend your choice with **TWO** reasons. [2]

Question 5

- a) Study the following Python code and answer the questions that follow.

Line	Code
1	<code>for i in range(8):</code>
2	<code>if i == 1:</code>
3	<code>Pass</code>
4	<code>elif i == 3:</code>
5	<code>Continue</code>
6	<code>elif i == 5:</code>
7	<code>break</code>
8	<code>else:</code>
9	<code>print(i)</code>

- i. Write the output of the program. [1]

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- ii. In the above program, there is a loop that iterates through a sequence of numbers. When the loop variable *i* has a value of 1, the pass statement is encountered. When *i* has a value of 5, the break statement is encountered. Explain the function of these two statements and describe what will happen in the program? [2]

- b) Dorji wants to calculate the product of the first 5 numbers (1 to 5). He was given the following code by his teacher but needs to complete it using a while loop.

Line	Code
1	<code>product = 1</code>
2	<code>num = 1</code>
3	<code>while _____:</code>
4	<code> product *= num</code>
5	<code> num _____</code>
6	<code>print("The product of the first 5 numbers is:", product)</code>

- i. What condition should Dorji use in the while loop to ensure it runs for the first 5 numbers? Write the correct code. [1]

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- ii. How should Dorji update the `num` variable inside the loop to ensure it increments correctly? [2]

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- iii. Modify the code to calculate the `sum` of numbers from 1 to 10 using `while` loop. [2]

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- c) Study the Python code and answer the questions that follow:

```
vehicle={'brand':'Toyota','model':'VigoHilux','year':2021}
```

- i. What type of data structure is `vehicle` in the given Python code? [1]

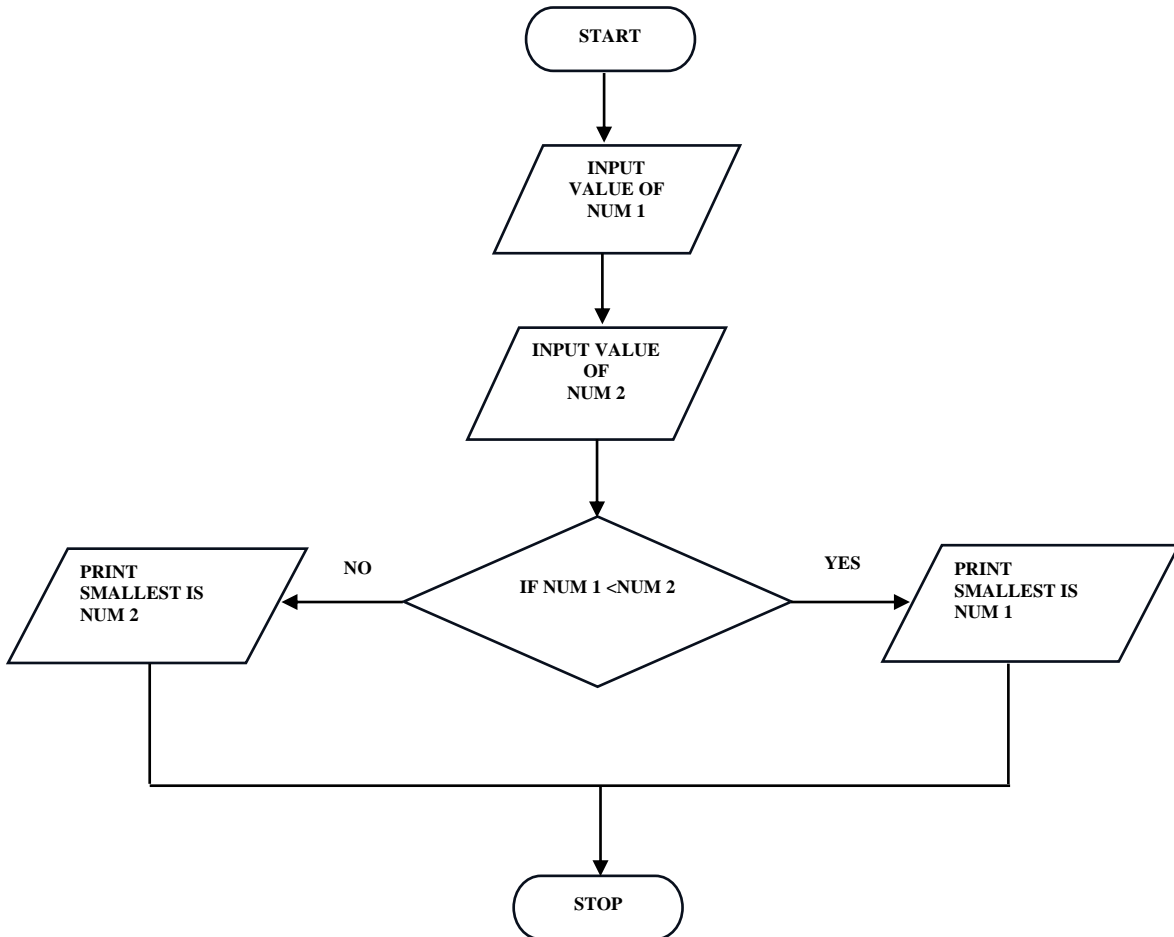
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- ii. How would you access the value associated with the key `'model'` in `vehicle`? [1]

Question 6

- a) As part of a programming assessment in your ICT class, you are tasked with writing a Python program that determines the smallest of two numbers. To ensure a structured approach, you are required to first follow the provided flowchart that outlines the steps of your program and then write the Python code.

[4]



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- b) Study the table and determine what would be a Boolean value of each statement under the X and Y columns and fill the remaining cells with correct Boolean values according to the logical operators used. [3]

X	Y	NOT Y	X AND Y	X OR Y
True	4 >= 7			
False	5 != 9			

- c) Study the code given below and answer the questions that follow.

Line	Code
1	def addition(x,y):
2	add = x + y
3	return add
4	cal = addition(10, 5)
5	print(f'Addition:{cal}')

1 _____

2 _____

- i. Write the correct terms for the components label with 1 and 2. [1]

1 _____	
2 _____	

- ii. Identify the keyword, function name and return value from the Python function code given. Write the output of the program? [2]

Question 7**[10]**

- a) You are asked to design a school mess management program that keeps record of all the items in the mess. Write a Python code using the function `mess_system()`. The function must incorporate the following operations:
- Display the title of the system 'School Mess Management Program'
 - Prompt the user to enter the quantity of four mess items (*rice, pulses, meat, potato*).
 - Store the quantities of the items entered by user in the Python list `mess_qty`.
 - Check whether there is enough rice or not based on the following conditions:
 - If the quantity of rice is more than or equal to 1200 kg, display the message "You have enough rice".
 - If the quantity is less than 1200 kg, prompt user to enter the new quantity of rice and update the existing quantity in the list `mess_qty`. Print the updated list.
 - The cost of each item is as follows:

Item	Cost/kg
<i>Rice</i>	<i>Nu. 40</i>
<i>Pulses</i>	<i>Nu. 50</i>
<i>Meat</i>	<i>Nu. 250</i>
<i>Potato</i>	<i>Nu. 30</i>

Calculate and print out the total expenditure incurred in purchasing all the items.

(Hint: Total expenditure = quantity X cost)

- Check whether there is enough budget or not based on the following conditions:
 - If the total expenditure is Nu. 50,000 and below, print out the message "You have enough budget", otherwise, print out the message "You don't have enough budget".

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