

SECTION A [40 MARKS]
ANSWER ALL QUESTIONS

Question 1

[30]

a) 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 letter.

i. Mr. Naphey wants to create a video using a song he found online. How can he ensure that he follows copyright rules?

- A Use the song freely since it's online
- B Give credit but not ask for permission
- C Edit the song and claim it as his own
- D Ensure content use align with licenses

ii. Study the code below. Which statement is true about its behaviour?

Line	Code
1	<code>i = 0</code>
2	<code>while i < 5:</code>
3	<code> if i == 3:</code>
4	<code> break</code>
5	<code> i += 1</code>
6	<code>print(i)</code>

- A The loop prints 1, 2, 3, 4
- B The loop prints 0, 1, 2, 3
- C The loop prints 1, 2, 3
- D The loop prints 0, 1, 2

iii. Sonam and Megan work in different place, but they need to collaborate to write a report. Which one of the following Google tools will let them edit the document simultaneously?

- A Google Meet
- B Google Docs
- C Google Sites
- D Google Slides

iv. For your science assignment, you cited Tashi Dorji's book *Public Health Challenges in Bhutan*, published by Bhutan Health Trust Fund in 2020. Select the appropriate reference entry as per the most recent APA style.

- A Dorji, T. (2020). *Public Health Challenges in Bhutan*. Bhutan Health Trust Fund.
- B T. Dorji. (2020). *Public health challenges in Bhutan*. Bhutan Health Trust Fund.
- C Dorji, T. (2020). *Public health challenges in Bhutan*. Bhutan Health Trust Fund.
- D Dorji, T. (2020). *Public health challenges in Bhutan*. Bhutan Health Trust Fund.

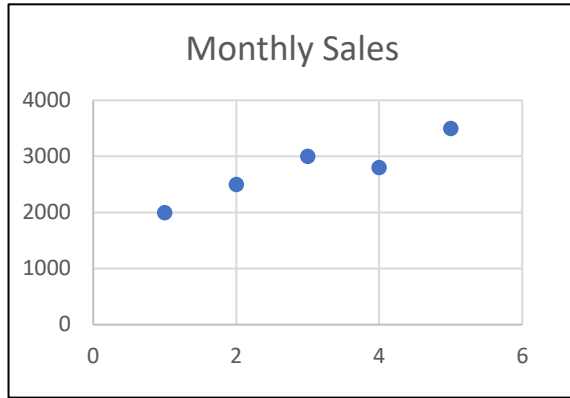
- v. The difference between list and tuples is that;
- A Both change often.
 - B Lists are fixed and tuples change.
 - C Lists change and tuples stay fixed.
 - D Tuples and Lists hold only numbers.
- vi. A school plans to control and provide high security to its data using cloud services. What kind of cloud is suitable?
- A Private Cloud.
 - B Cloud Hybrid.
 - C The Public Cloud.
 - D Cloud Community.
- vii. Select a valid function call that correctly uses those default values?

Line	Code
1	<code>def add(a, b=10):</code>
2	<code> return a + b</code>

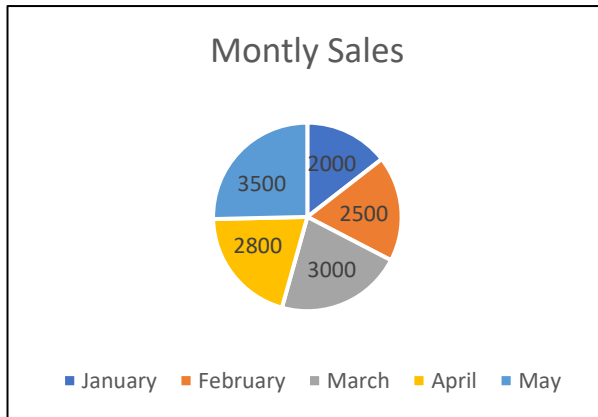
- A `add(a=5, b=10, c=15)`
 - B `add(5, 10, 15)`
 - C `add()`
 - D `add(5)`
- viii. Given the list `data = [10, 20, 30, 40, 50]`, and the slicing options for retrieving `[20, 30, 40]`. Which option will correctly retrieve the desired slice?
- A `data[0:3]`
 - B `data[1:3]`
 - C `data[1:4]`
 - D `data[2:5]`
- ix. You have been given a dataset as given below showing the monthly sales for five months by a business firm to work on the sales trend. Which type of chart in MS Excel would you use to best depict the sales trend over five months?

	A	B
1	Month	Sales
2	January	2000
3	February	2500
4	March	3000
5	April	2800
6	May	3500

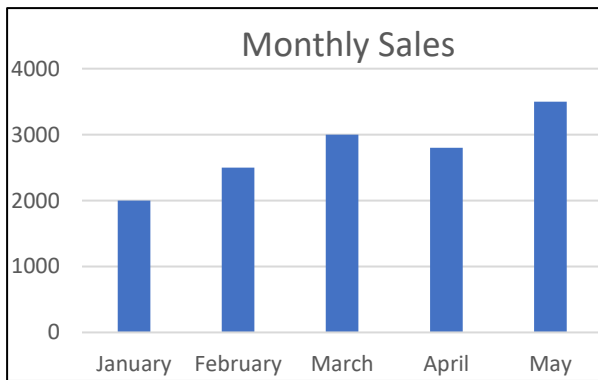
A



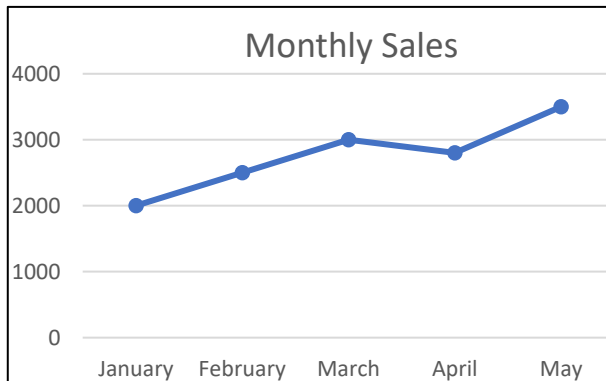
B



C



D



- x. Study the Excel table given below and answer the questions that follows.

	A	B	C	
1	Student ID	Name	ICT Marks	
2	101	Karma Wangmo	85	
3	102	Dorji Wangchuk	90	
4	103	Tashi Dendup	78	
5	104	Kelzang Lethro	88	

Which VLOOKUP formula will correctly return Tashi Dendup's score?

- A =VLOOKUP("Tashi Dendup", B2:C5, 2, FALSE)
B =VLOOKUP("Tashi Dendup", B2:C5, 3, FALSE)
C =VLOOKUP("Tashi Dendup", A2:C5, 2, FALSE)
D =VLOOKUP("Tashi Dendup", A2:C5, 3, FALSE)
- xi. A teacher gave the instructions on how to use "==" to compare string values. According to one student, "Apple" == "apple" would result in True. Which statement is correct?
- A True, both are strings
B True, Python ignores case
C False, Python is case sensitive
D False, Python compares only numbers
- xii. Your tutor instructs you to create an algorithm before writing a program that calculates a student's overall grade based on three subjects. Which of the following best describes an algorithm?
- A Structure to organize and store data.
B Math operation for totals and averages.
C Pre-made Python function storing values.
D Step-by-step instructions to solve a problem.
- xiii. The musician's use of a Creative Common BY-NC license means others can:
- A not share or use the song at all.
B remix the song, but not for profit.
C use without acknowledging musician.
D use the song freely, even commercially.
- xiv. ICT teacher is writing a python program to keep a record of books in the school library. Which data type correctly stores the number of books?
- A Float
B Bool
C String
D Int

xv. Given the values in A1:A6 as {45,70,55,80,40}, what is the result of the formula:
=AVERAGE (A1:A6, ">60")

- A 70.45
- B 71.67
- C 65.89
- D 60.35

b) Complete the following statements with the most appropriate word(s). [5]

i.	Google Drive stores data on remote _____ instead of a local device.	
ii.	In Python, a reusable block of code that performs a specific task, and can be called multiple times is called a _____.	
iii.	When writing a research paper, _____ citation is placed inside the text	
iv.	In a loop, _____ keyword skips the current iteration and move to next iteration.	
v.	The spreadsheet logical function that reverses the value of a condition, turning TRUE to FALSE and vice versa, is _____.	

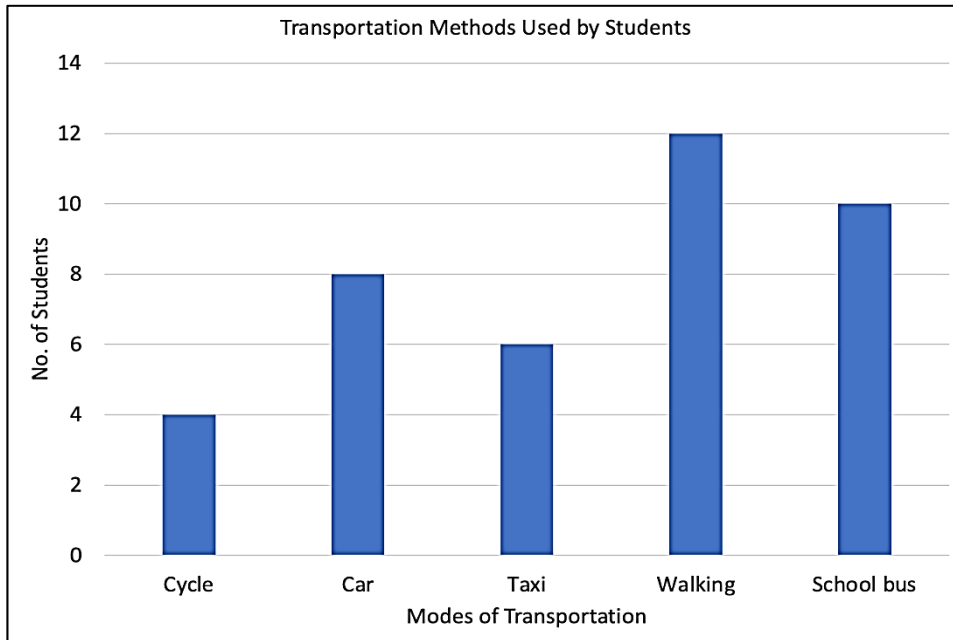
c) State whether the following statements are TRUE or FALSE in the space provided in the 'Answer' column. [5]

	Statements	Answer
i.	Python variable names treat <code>Fruit</code> and <code>fruit</code> as two different variables.	
ii.	The <code>RANK()</code> function arranges data in alphabetical order.	
iii.	Cloud services provide services over the internet.	
iv.	The use of copyrighted work from a journal in your physics project is allowed through consent from the author.	
v.	In a flowchart, <code>process</code> is represented by a parallelogram.	

SECTION B [60 MARKS]
ATTEMPT ALL THE QUESTIONS

Question 2

- a) A survey of 40 students from one class was conducted to find out how they travel to school. The information gathered is summarized in the graph below. Look at the column graph to understand the information.



- i. Which mode of transport do most students use? **[1]**

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- ii. What does the height of each bar in the graph represent? **[1]**

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- iii. Determine the number of students who do not take the bus to school. **[2]**

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- b) As an intern at a startup, your manager is seeking advice on company's data storage, and your purpose of using cloud storage. Give two reasons. **[2]**

- c) Which cloud service models, IaaS or SaaS, would better suit your school's IT team for increased efficiency and reduced on-site server maintenance? why? **[2]**

- d) As a class representative, you are collecting feedback on online learning using Google Forms to create a survey. Explain two features of Google Forms that help you gather and organize data effectively. **[2]**

Question 3

- a) Pema makes a fake social media account with his classmate's name and photo and posts embarrassing jokes and messages. **[1]**
What will be the consequences for Pema's unethical online behaviour?

- b) How can proper citation promote ethical behaviour online? **[1]**

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- c) You want to add a picture from the internet to your class project. How can you make sure you are using it legally and ethically? **[2]**

- d) You are helping a student understand how to solve problems using programming. How would you explain the difference between an algorithm and a flowchart? Mention any two differences. **[2]**

e) The following Python code is written by a student to test how `range()` works:

[2]

Line	Code
1	<code>for i in range (1,4):</code>
2	<code> print(i)</code>
3	<code>for j in range (3,0,-1):</code>
4	<code> print(j)</code>

Write the exact output that will be displayed when this program is run.

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f) In your Python simulation of the election of the school captain, you need two information for each candidate.

[2]

1. Candidates name
2. Number of votes received

Analyse the most appropriate data types for the two fields and explain why?

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Question 4

a) Explain the immutability of a string data type.

[1]

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- b) Show the concept of immutability by modifying the variable `car = "Alto"`. [2]

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- c) Examine the list `colors = ["red", "green", "blue"]` and analyse how the indexing works in the statement `print(colors[-1])`. What will be the output of the code? [1]

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- d) Study the code A and code B provided below. [2]

Code A: `attended = {"Rina", "Karma", "Sonam", "Tashi"}`

Code B: `submitted = {"Rina", "Sonam"}`

Write code to find and display the names of students who attended but didn't submit feedback.

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- e) Your teacher asks you to create a program that stores student records with their names and scores. Would a dictionary be a better choice than a list? Why or why not? [1]

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f) What is the difference between defining a tuple and a dictionary in Python? [1]

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g) Write a Python program to create a dictionary called student. Use the keys "name" and "age" with the values "Jampel" and 20. Next, add a new key "grade" with the value "A" and print the updated dictionary. [2]

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Question 5

a) Given a function `get_price(item_name)` that returns the price of an item, write a single line of Python code to store the price of "laptop" in a variable `laptop_cost`. [1]

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b) Study the function given below and identify the parameter and local variable declared within it. [2]

Line	Code
1	<code>def hello(f_name):</code>
2	<code> message = "Hello "</code>
3	<code> print(message, f_name)</code>
4	<code> first_name = "Sonam"</code>
5	<code> hello(first_name)</code>

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c) You are given two functions:

[1]

Line	Code
1	def greet():
2	print("Hello!")
3	def greet(name):
4	print("Hello", name)

Analyse what happens when both functions are present in the same program.

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d) Write a Python program that defines a function to find the square of a number. Use a default argument in the function. Then, call the function once with a number and once without passing any number.

[2]

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e) Study the recursive Python function code given below:

[4]

Line	Code
1	def countConsonants(text):
2	if text == " ":
3	return 0
4	elif text[0].isalpha() and text[0].lower() not
5	in "aeiou":
6	return 1 + countConsonants(text[1:])
7	else:
8	return countConsonants(text[1:])
	print(countConsonants("Bhutan"))

Explain how this function works by describing:

- i. What the base case does,
- ii. How it checks for consonants,
- iii. How the function uses recursion to solve the problem step by step, and
- iv. How many consonants are found in the word "Bhutan", with a short explanation.

Question 6

- a) During Coding Hackathon challenge, teams needed to write a program that checks whether a given number `num_1` is positive. **[1]**
 Two teams proposed two different conditions:
 Team A: `num_1 > 0`
 Team B: `num_1 >= 1`
 Justify why Team A's condition is more appropriate.

- b) All provided versions of code to print numbers from 1 to 5, one with `for` loop, the other with a `while` loop. **[2]**
 Which version is more efficient for this task, and why? Provide two justifications to support your answer.

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c) What will be the output of the following code? [1]

Line	Code
1	for i in range(2,10,3):
2	print(i, end=" ")

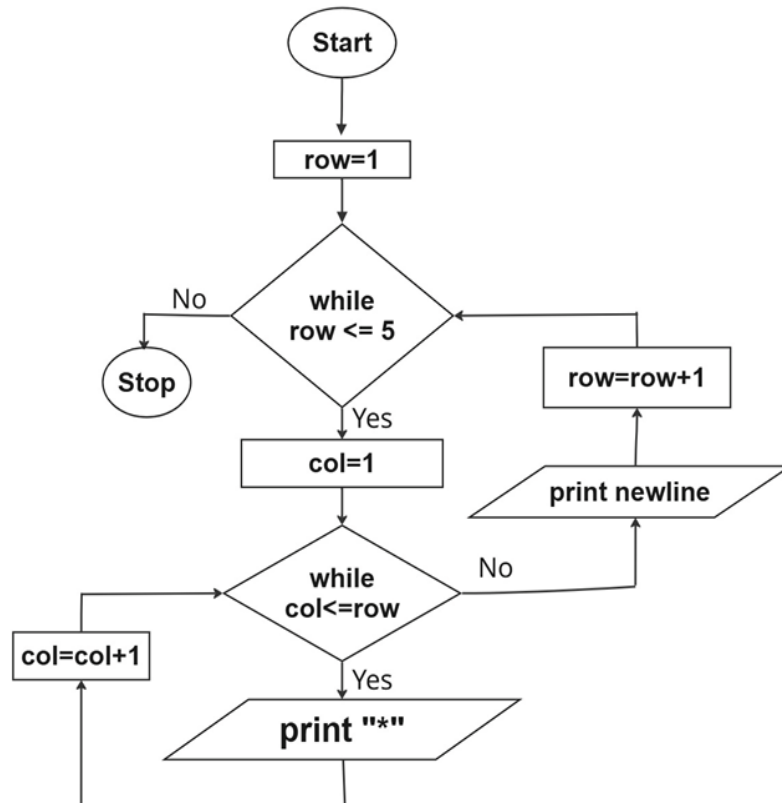
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d) Write a program to find the circumference(c) of a circle with radius, r=20 unit. [2]

[Hint: $c = 2\pi r = 2 \times 3.14 \times r$]

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e) The flowchart below represents a logic that prints a right-angled triangle pattern using asterisks (*). Use the flowchart and write a Python program to simulates the logic shown in it. [4]



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Question 7

- a) As part of a Technology Innovation startup competition, a group of students proposed Python-based simulation of Mobile Banking program, the group has been now tasked with designing and implementing Python based simulation Mobile Banking program.
Create the program to:
- i. Declare and initialize a variable `balance` with the value Nu. 1000. [1]
 - ii. Continuously display a menu of options and accept user input until the user chooses to exit. [2]

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===== Menu =====
1. Check Balance
2. Deposit Money
3. Withdraw Money
4. Exit
Enter your choice (1-4):

```
 - iii. **Add code to implement the check balance feature when choice 1 is selected:** [1]
 - a. Display the current balance to the user.
 - iv. **Add code to implement the deposit feature when choice 2 is selected:** [2]
 - a. Prompt the user to enter the amount to deposit.
 - b. Validate that the amount is greater than zero; if not, display an appropriate error message.
 - c. Update the balance by adding the deposit amount and display the new balance.
 - v. **Add code to implement the withdrawal feature when choice 3 is selected:** [2]
 - a. Request the user to input the withdrawal amount.

- b. Check that the amount is positive and does not exceed the current balance; if these conditions are not met, display an error message.
 - c. Deduct the withdrawal amount from the balance and display the updated balance.
- vi. Exit the program when the user selects choice 4 with the message: [1]
"Thank you for banking with us!"
- vii. Handle invalid menu selections by displaying an error message for any choice not listed in the menu such as: [1]
"Invalid selection. Please choose a valid option."

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