Computer Science

Exam

Duration: 2h **Name:** ..... **Documents:** Not allowed

Circle the letter of the correct answer. Only one answer is correct per question (1 pt each).

Q1. L1 Which of the following best describes **Decomposition**? *1 pt*

A. Removing unnecessary details from a problem to focus on what matters.

B. Breaking a complex problem into smaller, more manageable sub-problems.

C. Writing a set of step-by-step instructions to solve a problem.

D. Converting a pseudocode algorithm into a programming language.

Q2. L2 In a flowchart, which shape is used to represent a **decision**? *1 pt*

A. Rectangle (process box).

B. Oval (start / end terminal).

C. Diamond.

D. Parallelogram (input / output).

Q3. L3 What is the result of `9 % 4` in Python? *1 pt*

A. 2

B. 2.25

C. 1

D. 4

Q4. L3 Which of the following is a **valid** Python variable name? *1 pt*

A. `3value`

B. `my value`

C. `_result`

D. `while`

State whether each statement is **True** or **False**, then write a brief justification (1 pt each).

Q5. *4 pts*

a. L1 Abstraction means keeping *all* details of a problem, including unnecessary ones.
Answer: _____ **Justification:**

b. L2 A WHILE loop executes its body at least once before checking the condition.
Answer: _____ **Justification:**

c. L2 The three structured programming control structures are: sequence, selection, and repetition.
Answer: _____ **Justification:**

d. L3 In Python, `Name` and `name` refer to the same variable.
Answer: _____ **Justification:**

Read carefully, then answer the questions.

Q6. L2 Study the following algorithm and answer the questions. *4 pts*

```
BEGIN
  PRINT "Enter N:"
  READ N
  sum     = 0
  counter = 1
  WHILE counter <= N
      sum     = sum + counter
      counter = counter + 1
  END_WHILE
  PRINT sum
END
```

a. What does this algorithm compute? (1 pt)

b. Complete the trace table below for $\mathbf{N = 4}$ (2 pt):

N	**sum**	**counter**	**counter $\leq$ N**
4	0	1	T

c. What value is printed at the end? (1 pt)

Q7. L1 L2 Write a pseudocode algorithm that reads two numbers and prints the largest one. Then explain how **Abstraction** and **Algorithmic Thinking** are applied in your solution. *4 pts*

Algorithm:

Abstraction:

Algorithmic Thinking:

Read the Python programs carefully and answer the questions.

Q8. L3 What is the exact output of the program below? Explain each line briefly. *2 pts*

```
a = 14
b = 4
print("Floor div:", a // b)
print("Remainder:", a % b)
print("Power:",      b ** 3)
text = "Algorithm"
print(len(text))
print(text[0])
```

Output and explanation:

Output line	Explanation

Q9. **L3** The program below contains **3 errors**. Identify each one, explain it, and write the corrected version. *2 pt*

```
my grade = int(input("Enter grade: "))
If my_grade >= 50
    print("Pass")
```

#	Error description	Correction
1		
2		
3		

Corrected program:

Good luck, Module Responsible: Lahmer Amira