

Python Programming Examination (Total Marks: 48)

Generated by Gemini

Academic Year 2024-2025

Instructions:

- ◇ Attempt all questions.
 - ◇ Write the correct answer only for Section A (MCQ).
 - ◇ Show clear code or explanations for Sections B and C.
 - ◇ Time Allotted: 1.5 Hours
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Section A: Multiple Choice Questions (MCQ) (10 × 1 Mark = 10 Marks)

1. Which of the following is an invalid variable name in Python?
 - (a) `my_variable`
 - (b) `variable2023`
 - (c) `2023variable`
 - (d) `_temp`
2. What is the correct way to initialize an empty dictionary in Python?
 - (a) `dict()`
 - (b) `{}`
 - (c) `[]`
 - (d) `()`

3. What is the output of the following expression in Python?

$$5 + 3 * 2 \div 4$$

- (a) 4
 - (b) **6.5**
 - (c) 8
 - (d) 5.5
4. What is the primary purpose of the `pass` statement in Python?
 - (a) To terminate a loop or conditional statement.
 - (b) To skip the current iteration of a loop.
 - (c) **To be a placeholder for future code, satisfying syntax requirements without doing anything.**

- (d) To indicate the end of a function or class definition.
5. If $S = \text{'Python'}$ is a string, what will `len(S)` return?
- (a) **6**
 - (b) 5
 - (c) 0
 - (d) Error
6. Which keyword is used to define a class in Python?
- (a) `struct`
 - (b) `def`
 - (c) **`class`**
 - (d) `object`
7. By default, what is the data type of the value returned by the `input()` function?
- (a) Integer
 - (b) **String**
 - (c) Float
 - (d) List
8. Which list method is used to add a single element to the end of a list?
- (a) `insert()`
 - (b) `extend()`
 - (c) **`append()`**
 - (d) `add()`
9. Which of the following data types is considered immutable in Python?
- (a) List
 - (b) Dictionary
 - (c) **Tuple**
 - (d) Set
10. What is the correct syntax for a single-line comment in Python?
- (a) `// This is a comment`
 - (b) `/* This is a comment */`
 - (c) **`# This is a comment`**
 - (d) `-- This is a comment`
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Section B: Short Answer Questions (4 × 2 Marks = 8 Marks)

11. Briefly explain the key difference between a Python `List` and a `Tuple` in terms of mutability. (2 Marks)
 12. What is the use of the `elif` statement in Python conditional logic? (2 Marks)
 13. What is a docstring, and what are two common conventions for enclosing them? (2 Marks)
 14. Explain the concept of 'aliasing' when working with Python lists and demonstrate it with a two-line code example. (2 Marks)
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Section C: Coding and Long Answer Questions (6 × 5 Marks = 30 Marks)

15. Write a Python function called `calculate_factorial` that accepts a non-negative integer `n` and calculates its factorial using **recursion**. The function should return the final result. (5 Marks)
16. Explain and briefly demonstrate four core principles of Object-Oriented Programming (OOP) as implemented in Python. (5 Marks)
17. Write a Python class named `Animal` with an `__init__` method that takes `name` and `species` as arguments. Then, create a subclass named `Dog` that inherits from `Animal` and adds a method `bark()` that prints a sound. (5 Marks)
18. Write a complete Python code snippet to read the contents of a text file named `data.txt`, count the number of lines it contains, and print the final count. Ensure you use best practices for file handling. (5 Marks)
19. Explain the purpose of the `try`, `except`, and `finally` blocks in Python's exception handling, and provide a minimal code example using all three. (5 Marks)

20. Write a Python function named `get_even_numbers` that accepts a list of integers as its argument and returns a **new list** containing only the even numbers from the original list. Demonstrate calling the function with a sample list. (5 Marks)