

Name of the candidate: \_\_\_\_\_

(1.2 points) **Question 1**

What is the difference between pass-by-value and pass-by-reference in C++? Write a function that swaps two integers using pass-by-reference.

**Answer**

---

(1.2 points) **Question 2**

What is function overloading in C++? Write two overloaded functions named `calculate` that compute the area of a rectangle and a circle respectively.

**Answer**

Name of the candidate: \_\_\_\_\_

(1.2 points) **Question 3**

Explain the difference between `public`, `private`, and `protected` access specifiers in C++. Give an example class that demonstrates all three.

**Answer**

---

(1.2 points) **Question 4**

What is a pure virtual function in C++ and how to declare it? Write an example.

**Answer**

Name of the candidate: \_\_\_\_\_

(1.2 points) **Question 5**

What is a destructor in C++? Write a simple class `Counter` that prints a message when it is created and destroyed.

**Answer**

---

(1.2 points) **Question 6**

What is list comprehension in Python? Write a list comprehension that generates the squares of even numbers from 0 to 10.

Name of the candidate: \_\_\_\_\_

(1.2 points) **Question 7**

What is a Python module? Write code that imports the `math` module and uses it to calculate the square root of 16.

**Answer**

---

(1.2 points) **Question 8**

What is string formatting in Python? Write code that uses f-strings to display a person's name and age in a sentence.

**Answer**

Name of the candidate: \_\_\_\_\_

(1.2 points) **Question 9**

What are list slicing and indexing in Python? Write code that demonstrates how to access the first element, last element, and middle portion of a list using different indexing techniques.

**Answer**

---

(1.2 points) **Question 10**

In pybind11, how do you create a simple Python module from C++? Write the basic structure to expose a C++ function called `multiply` that multiplies two numbers.

**Answer**