Quiz 5

The Art of Computer Programming

19 October 2026

Full name: .....

You have 10 minutes to answer this quiz, directly on this sheet of paper. No electronic devices or material of any kind is allowed. Do not forget to add your name above. Every question amounts to 2 points; the quiz is graded out of 10 points.

Questions

Q1. Circle the (only) correct answer. Why are the properties of a class usually made private (or protected)?

a. So that the program runs faster.

b. So that only the methods of the class can modify them, and the rest of the program cannot break the consistency of an object.

c. So that the objects of the class are stored on the heap.

d. So that the objects of the class cannot be copied.

Q2.
```c
struct Point { int x, y; };
struct Point a = {1, 2};
struct Point b = a;
b.x = 10;
printf("%d %d\n", a.x, b.x);
```

What does this C code fragment print? .....

Q3.
```python
class Vec:
    def __init__(self, x, y):
        self.x = x
        self.y = y
    def __add__(self, other):
        return Vec(self.x + other.x, self.y + other.y)
    def __str__(self):
        return f"({self.x}, {self.y})"

print(Vec(1, 2) + Vec(3, 4))
```

What does this Python code fragment print? .....

Q4.

```
class A {
public:
  A() { std::cout << "built "; }
  ~A() { std::cout << "destroyed "; }
};

void f() {
  A a;
  std::cout << "in f ";
}

int main() {
  f();
  std::cout << "end\n";
}
```

Circle the (only) correct answer. This C++ program:

a. prints `built in f destroyed end`.

b. prints `built in f end destroyed`.

c. prints `built in f end`: the destructor only runs on `delete`.

d. prints `in f end`: `A a;` declares `a` without constructing it.

Q5.

```
class Counter:
    def __init__(self):
        self.value = 0
    def increment(self):
        self.value += 1

c = Counter()
c.increment()
c.increment()
print(c.value)
```

Circle the (only) correct answer. This Python code fragment:

a. prints `0`.

b. prints `1`.

c. prints `2`.

d. fails: `increment` is called without its parameter `self`.