Quiz 4

The Art of Computer Programming

12 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. In a C function, which of the following is a good reason to allocate an array on the heap with `malloc`, rather than to declare it as a local variable?

a. Accessing the elements of an array on the heap is faster.

b. Its number of elements is only known when the program runs.

c. The heap is released automatically when the function returns.

d. An array on the heap knows its own size.

Q2.
```c
int a[5] = {10, 20, 30, 40, 50};
int *p = a + 1;
printf("%d\n", *(p + 2));
```

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

Q3.
```c
void reset(int a[], int n) {
  for (int i = 0; i < n; i++)
    a[i] = 0;
}

int main(void) {
  int t[3] = {1, 2, 3};
  reset(t, 3);
  printf("%d\n", t[1]);
}
```

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

a. prints `0`.

b. prints `2`.

c. does not compile: an array cannot be passed to a function.

d. has undefined behavior.

Q4.
```
std::set<int> s = {5, 1, 3};
s.insert(1);
s.insert(4);
for (int x : s)
  std::cout << x << " ";
```

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

Q5.
```
int count(void) {
  static int n = 0;
  n++;
  return n;
}

int main(void) {
  count();
  count();
  printf("%d\n", count());
}
```

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

a. prints `1`.

b. prints `3`.

c. prints `0`.

d. does not compile: `n` is not a global variable.