

CSc 372 ICA12: Last quiz, final exam prep

Name	
UA Email	

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Question 1. Put the letter for the best answer ☐

Which of the following best describes SML's type system?

- A. strong, static, and inferred
- B. strong, dynamic, and inferred
- C. weak, static, and based on annotations
- D. strong, static, and based on annotations
- E. weak, dynamic, and based on annotations

Question 2. Put the letter for the best answer ☐

Which of the following best describes Chapel's type system?

- A. strong, static, and inferred
- B. strong, dynamic, and inferred
- C. weak, static, and based on annotations
- D. strong, static, and based on annotations
- E. weak, dynamic, and based on annotations

Question 3. Put the letter for the best answer ☐

In Python, the function `isinstance()` is an example of what?

- A. dynamic type checking
- B. polymorphism
- C. static type checking
- D. inheritance
- E. block scoping

Question 4. Put the letter for the best answer ☐

In Java, there is a class: `java.util.ArrayList<E>`. The E here is an example of what?

- A. overloading
- B. parametric polymorphism
- C. parameter coercion
- D. subtype polymorphism
- E. inheritance

Question 5. Put the letter for the best answer ☐

For which types of applications is pattern matching particularly useful for creating solutions that are both concise and easy to maintain?

- A. Applications involving low-level memory management.
- B. Applications requiring structured data processing, such as compilers and interpreters.
- C. Applications focused on graphical user interface design.
- D. Applications that rely heavily on mutable state and side effects.

Question 6. Put the letter for the best answer ☐

What is the primary difference between parallelism and concurrency in programming?

- A. Parallelism focuses on performing multiple tasks simultaneously, while concurrency involves managing multiple tasks that can progress independently.
- B. Concurrency requires multiple processors, whereas parallelism can run on a single processor.
- C. Parallelism is about dividing tasks into smaller parts, while concurrency focuses on task execution order.
- D. Concurrency guarantees tasks will execute at the same time, while parallelism does not.

Question 7. Put the letter for the best answer ☐

What is the primary difference between syntax and semantics in programming languages?

- A. Syntax defines how a program behaves during execution; semantics defines how it is written.
- B. Syntax refers to how code is structured; semantics refers to what the code means.
- C. Syntax is used to optimize performance; semantics is used to format output.
- D. Syntax determines memory layout; semantics determines variable types.

Question 8. Put the letter for the best answer ☐

Which of the following is an example of a memory issue in programming?

- A. Dangling pointers, where a pointer references memory that has been deallocated.
- B. Use-after-free errors, where memory is accessed after it has been freed.
- C. Buffer overflows, where data is written beyond the allocated memory bounds.
- D. Memory leaks, where allocated memory is no longer reachable but not reclaimed.
- E. All of the above.

Question 9. Put the letter for the best answer ☐

Consider the following function:

```
1 fun foo [] = []  
2 | foo (x::xs) = x :: foo xs;
```

What is the result of `foo [1,2,3,4,5]`?

- A. 5 B. 1 C. [1,2,3,4,5] D. [5,4,3,2,1]
- E. There is no result because the function will infinitely recurse.

Question 10. Put the letter for the best answer ☐

Consider the following Prolog code: `foo(X,Y) = sibling(X,P), parent(P,Y).`

Assuming there is a database of "parent" facts where `parent(S,T)` means that "S is a parent of T" and `sibling(A,B)` means "A and B are siblings", what does `foo(V,W)` mean?

- A. V is the grandchild of W B. V is the sibling of W C. V is the grandparent of W
- D. V is the aunt or uncle of W E. None of the above