

CS/CIS Comprehensive Exam—Spring 1998
Programming Languages
Section A

Instructions: Do not put your name on the exam, write your code number on the top of every page. Please answer all the questions directly on the exam itself. Answer 10 of the following 14 questions in four or five sentences.

1. Argue that readability and writability are poor criteria for evaluating programming language design.
2. Describe briefly as many object-oriented languages as you can, *exclude* C++.
3. Give a BNF definition for expressions in some hypothetical programming language. Use a simple, but reasonable model for expressions.
4. What differences are there between languages with regard to type equivalence?
5. What is the difference between narrowing and widening?
6. In APL all operators have the same precedence. What are the pros and cons of this approach?
7. What is the definition of *control structure*?
8. What is the difference between pass by name and pass by reference?
9. What is the purpose of the display in the implementation of ALGOL-like languages?
10. Write a very short C or C++ program that demonstrates that these languages do no inter-module type checking.
11. In every language since PL/I, exception propagation is essential the same. Describe exception propagation in ML, Ada, C++, Modula-3, and Java.
12. What is a higher-order function? Give an example.
13. Define *resolution*. What does it have to do with PROLOG?
14. What is an object-oriented programming language?