

# Comparative Programming Languages

## UCT CSC304 – Class Test – 2003

1. “If Prolog was object-oriented, it would be a universal programming language”. Discuss two arguments to dispute this statement. [4] (universal means that we do not need anything else)
2. Besides Pascal’s variant records and C’s unions, list two other examples of how aliasing can occur in a programming language (such as C++). [2]
3. What do dynamic typing and dynamic scoping of variables have in common (besides the word “dynamic”)? [2]
4. Consider the following program in an ALGOL-like statically-scoped language, using displays.

```
program main ()
  subprogram funca ()
  {
    funcb ();
    // breakpointX
  }
  subprogram funcb ()
  {
    subprogram funcc ( int x )
    {
      x = 0;
      // breakpointY
    }
    funcc (6);
  }
  // breakpointZ
  funca ();
}
```

- 4.1. What would the display look like at each of the 3 breakpoints indicated? [6]
- 4.2. Can a display be used for a dynamically-scoped language? If so, how – if not, why? [3]
5. In languages that allow side-effects, short-circuit evaluation of Boolean expressions can result in incorrect or unpredictable results. Explain how this can occur. [2]
6. Most languages that support exceptions choose not to return control to the statement that raised the exception. Why? [2]
7. In some languages semaphores are part of the basic syntax but in others the functionality is provided through a library. State two possible advantages of the latter approach. [4]