

Quiz 1, CSCI 360, Fall 2004

Name: _____

1. [10 pts] Complete the following Ada program to display the numbers between 1 and 10.

```
with Text_IO; use Text_IO;
procedure Print_Nums is
    package Int_IO is new Integer_IO(Integer); use Int_IO;

begin
```

```
end Print_Nums;
```

2. [10 pts] Assume that the Ada program at right compiled successfully.

a. If the compiler assumed pass-by-value parameters, what would this program print?

b. What if it it assumed pass by value-result?

c. What about pass by reference?

```
with Text_IO; use Text_IO;
```

```
procedure Test is
```

```
    I : Integer;
```

```
    J : Integer;
```

```
    procedure Y(A : Integer; B : Integer) is
```

```
    begin
```

```
        A := 1;
```

```
        I := 2;
```

```
        B := 3;
```

```
    end Y;
```

```
begin
```

```
    I := 4;
```

```
    J := 5;
```

```
    Y(I, J);
```

```
    Put_Line(Integer'Image(I) & " " & Integer'Image(J));
```

```
end Test;
```

3. [7 pts] Consider the following BNF grammar.

$$\mathbf{A} ::= a \mathbf{B} b \mid c$$
$$\mathbf{B} ::= b \mathbf{A} \mathbf{A} a \mid \mathbf{A}$$

At right, draw a parse tree based on this grammar for the sentence $a b c a c b a b$.

4. [8 pts] Using BNF syntax, write a context-free grammar for the language of zero or more a 's listed separated by commas, but without beginning or ending in a comma. The four shortest strings in the language are the empty string, " a ", " a,a ", " a,a,a ".

5. [15 pts] Prove the following using our axiomatic scheme.

```
{sum = i2}  
sum := sum + 2 * i + 1;  
{sum = (i + 1)2}
```