Name and signature	Proctors' name and signature	Total score

Test Id: 4 **(This test consists of 10 questions)**

Note: ***No electronic devices (laptops, smart devices, etc. except calculators) are allowed.***

Questions with one correct answer

Question 1. In Prolog, suppose that the following clauses

$ancestor(X, Y) :- parent(X, Z), ancestor(Z, Y).$
$ancestor(amy, bob).$
$parent(eve, amy).$

have been entered into the database, then which of the following queries would cause the "no" response?

- ☐ $? - parent(eve, amy).$
- ☐ $? - ancestor(eve, bob).$
- ☐ $? - ancestor(amy, bob).$
- ☐ $? - ancestor(bob, eve).$

Question 2. Which of the following Pascal programs causes an incompatible type error?

- ☐ var i: Integer; begin Writeln(i:=1); end.
- ☐ var i: Integer; begin Writeln; i:=1.0; end.
- ☐ var i: Integer; begin Writeln(i=1); end.
- ☐ var i: Integer; begin Writeln; i:=1; end.

Question 3. In Ada, which of the following statements is legal?

- ☐ while I >= 10 do J := J - 1; end while;
- ☐ while I <= 5 do J := J + 1; end loop;
- ☐ while J <= 10 loop J := J + 1; end loop;
- ☐ I = I * 1;

Question 4. In Java, which of the following statements is legal?

- ☐ if (int v = 0) return v;
- ☐ int v; if (v == 0) v=v+1;
- ☐ System.out.println('Hello World');
- ☐ int v=1; if (v != 0) v=v+1;

Question 5. In C#, which of the following statements is legal?

- ☐ System.out.println("Hello World");
- ☐ Console.WriteLine("Hello World");
- ☐ if (int v == 0) return v;
- ☐ int v; if (v != 0) v=v+1;

Question 6. In Python, which of the following statements is legal?

- ☐ if (v != 0) v=v+1;
- ☐ printf ("Hello World");
- ☐ Console.println("Hello World");
- ☐ sum = float(1.0) + float(2);
- ☐ sum := float(1) + float(2);
- ☐ println('Hello World');

Constructed-response questions

Question 7. Describe briefly your contribution to your group project (i.e. the project that your group has taken in this course).

Question 8. Explain shortly why C++ is more memory-efficient than Java (i.e. 1.6 vs 9.1 for space).

Question 9. Give a functional form in C of the following Pascal code.

```
function sum (n: Integer): Integer;
   var i,s: Integer;
   begin
      s:=0;
      if n<=0 then
         sum:=0;
      else
         for i := 1 to n do
            s:=s+i;
      sum:=s;
   end
```

Question 10. Give a piece of code in Java, that is eqpivalent to the following code in C++.

```
enum Disc {IsInt,IsReal};
struct IntOrReal {
   enum Disc which;
   union {
      int i;
      double r;
   };
};
```

Constructed-response questions

Question 7. Describe briefly your role and tasks in your group project (i.e. the project that your group has taken in this course).

Question 8. Explain shortly why C++ is faster than Java (i.e. 1.0 vs 1.7 for speed).

Question 9. Give an imperative form in C of the following Pascal code.

```
function prod (n: Integer): Real;
  begin
    if n>=1 then
      prod:=n*prod(n-1)
    else
      prod:=1.0;
  end
```

Question 10. Give a piece of code in C++, that is equivalent to the following code in Java.

```
class A
{ A A(A A)
  { A:
    for(;;)
    { if (A.A(A) == A) break A; }
    return A;
  }
}
```