1. Briefly define, in the context of this course, each of the following terms.

   a. **problem specification**
   b. **CASE**
   c. **recursion**
   d. **HTML form**
   e. **assembly language**

2. List two factors that complicate the writing of specifications.

3. Arrange these terms hierarchically (i.e., as a "contains" relationship):

   * statements
   * functions
   * programs
   * tokens

4. Convert the following binary numbers to their decimal equivalents:

   * 11000
   * 110010
   * 10011
   * 10211

5. Given that \( x \) and \( y \) are numeric parameters, describe what this function returns:

   ```
   function mystery(x, y)
   {
     x = x - y;
     y = x + y;
     x = y - x;
     return x;
   }
   ```

6. What is the value of result in the following program code?

   ```
   function F(n) // returns n^3
   {
     var temp = 0;
     var index = 0;
     while (index < n)
     {
     ```
temp = temp + (n * n);
index = index + 1;
}
return temp;
}

function test()
{
    var result = F(3);
}

7. The discriminant of a quadratic equation
\[ a x^2 + b x + c = 0 \]

is given by the equation
\[ \text{discriminant} = b^2 - 4 a c \]

Show the parse tree for the discriminant equation.

8. Refer to #7 above, now generate the PIPPIN assembly code for the parse tree to determine the discriminant of a quadratic equation.

9. Find the logic error(s) in the following program fragment.

    function pounds(x, y)
    {
        y = 2.2 * x;
        return y;
    }

    funtion weight()
    {
        var start = 10;
        return pounds(start);
    }

10. Implement the following Javascript loop in PIPPIN assembly language.

    {
        var w = 10, x = 0;
        while (x < w)
            x++;
    }