Name: _____

CSC 121: Computers and Scientific Thinking
Sample Test

Test 1

1. True/False	(8 pts) :	
2. Computer Basics	(6 pts) :	
3. Internet & Web	(7 pts) :	
4. Science & Computing	(6 pts) :	
5. Static Web Pages	(14 pts) :	
6. Dynamic Web Pages	(12 pts) :	
TOTAL	**(53 pts):**	

I pledge that I will not discuss the contents of this test with anyone for 24 hours.

Signed: _____

QUESTION 1: True/False (8 points)

_____ The World Wide Web was developed in the early 1970's, shortly after the development of the Internet.

_____ Vacuum tubes, as they have no moving parts, enable the switching of electrical signals at speeds far exceeding those of relays.

_____ The three main components of the *von Neumann architecture* are the hardware, software, and operating system.

_____ Since computer programs can be difficult to write and debug, they are referred to as *hardware*.

_____ In the HTML tag below, the text highlighted in bold is a *JavaScript statement*.

```
<button onclick="document.getElementById('outDiv').innerHTML='Hi!';">
    Show Message
</button>
```

_____ Since a collection of 4 *bits* can represent up to 16 different values, it follows that a collection of 8 bits can represent up to 32 different values.

_____ A *multi-core* processor is able to execute multiple instructions simultaneously, and thus can complete many tasks faster than a single-core processor.

_____ Greek natural philosophy is sometimes called "pre-scientific," since it relied on contemplation or observation, but not experimentation.

QUESTION 2: Computer Basics (6 points)

A. Jacquard's loom, although unrelated to computing, influenced the development of modern computing devices. What design features of that machine are relevant to modern computer architectures?

B. Modern computers integrate several *different types of memory*, such as cache, RAM, hard disk, and flash drive. Why are different types of memory used, as opposed to the exclusive use of a particular technology? What would be the drawbacks, for example, of using only cache memory, or only hard disk?

QUESTION 3: Internet & Web (7 points)

A. Paul Baran proposed two groundbreaking design ideas for the structure and behavior of the ARPANet. Describe these design ideas and the benefits they provide.

B. The two main pieces of software that make the World Wide Web work are the *Web browser* and the *Web server*. Describe the roles of these two programs in enabling users to surf the Web. What is HTTP and how is it involved in the process?

QUESTION 4: Science & Computing (6 points)

A. In Lab 1, you utilized two Montel Carlo methods to approximate the value of π: throwing darts at a circle and dropping needles on a grid. What, in general is a *Monte Carlo method*? Describe one other use of a Monte Carlo method to solve problems in the sciences.

B. If you repeatedly flipped a coin, you would expect to obtain HEADS roughly half of the time. Suppose Chris performs four different experiments, flipping a coin 50 times each and obtains HEADS 21, 23, 26, and 30 times, respectively. Similarly, Pat performs a different four experiments, flipping the coin 100 times each and obtaining HEADS 45, 53, 43, and 51 times, respectively. Which set of data is more consistent? Which set of data is more accurate? Justify your answers.

this space is reserved for Question 5

QUESTION 5: Static Web Pages (14 points)

```
<!doctype html>
<!-- test1.html       Sample page for Test 1 -->
<!-- ====================================== -->
<html>
  <head>
     <title>Eiffel Tower</title>
 </head>
 <body>
   <img src="eiffel-tower.jpg" alt="Photo of the Eiffel Tower">

   <p>The Eiffel Tower is the tallest structure in Paris and is the
   single most visited paid monument in the world.

   It is named after its designer and engineer <i>Gustave Eiffel</i>.
   </p>
   <p>Visitors can reach the top by climbing <b>300</b> steps, <br>or by taking
      an elevator. </p>

   <table >
     <tr><td style="border-style:solid">Location </td>
         <td style="border-style:solid">Paris, France </td></tr>
     <tr><td style="border-style:solid">Completed </td>
         <td style="border-style:solid">1889 </td></tr>
     <tr><td style="border-style:solid">Height </td>
         <td style="border-style:solid">1,063 feet (324 m) </td></tr>
   </table>

   <h2>Replicas can be found at:</h2>
   <ul>
     <li> Disney Epcot Center </li>
     <li> Las Vegas </li> <li> Hangzhou, China</li>
   </ul>

   <hr>

   <p style="text-align:right">source:
     <a href="http://en.wikipedia.org/wiki/Eiffel_Tower">Wikipedia</a></p>
 </body>
</html>
```

A. *On the back of the **previous page***, draw a picture of the Web page that would be generated by the above HTML document. Be specific with respect to formatting and page layout.

If a line of text wraps to the next line in your drawing, mark the end of that line with an arrow. For example:

> This is an example of text in the page that →
> wraps to the next line.

B. What is the purpose of the 2nd and 3rd lines in the document, i.e., the lines starting with <!-- and ending with --> ? Would removing these two lines change the way that the page is displayed in the browser?

C. The page contains an image of the Eiffel Tower. Where is the image file stored (i.e., locally or on the Web? in what folder?)? What would appear in the page if the image could not be found by the browser?

D. What would happen within the browser when the user clicked on the hyperlink? What would appear in the browser if the computer were not connected to the Internet?

E. Modify the HTML document so that your name appears at the top of the page, centered and in a large font. You may list the new text below, with an arrow in the HTML document to identify where the text should be inserted.

QUESTION 6: Dynamic Web Pages (12 points)

```
<!doctype html>
<html>
 <head>
   <title>Computer Hardware</title>
 </head>
 <body>
   <h1>Hardware Components</h1>
   <table>
   <tr>
     <td><img src="questionMark.gif" alt="mystery image 1"
              onmouseover="this.src='mouse.jpg';"
              onmouseout="this.src='questionMark.gif';"></td>
     <td><span id="span1">   </span></td></tr>
   <tr>
     <td><img src="questionMark.gif" alt="mystery image 2"
              onmouseover="this.src='keyboard.jpg';"
              onmouseout="this.src='questionMark.gif';"> </td>
     <td><span id="span2">   </span></td></tr>
   </table>
   <hr>
   <i>CSC121 - Sample Test</i>
 </body>
</html>
```

A. *In the **space below***, draw a picture of the Web page that would be generated by the above HTML document. Be specific with respect to formatting and page layout. You may assume that `questionMark.gif`, `mouse.jpg`, and `keyboard.jpg` are images of a question mark, computer mouse, and keyboard, respectively.

B. Describe the changes that would occur within the page when the mouse moves over each image. Likewise, what happens when the mouse moves off of each image?

C. Suppose the developer of the above page had made a typing error, misspelling the attribute name `onmouseout` in one of the IMG elements, e.g., `onmousout`. Would this page still load and look the same in the browser? Would it behave the same when the user interacts with the image?

D. Suppose that, *in addition to the image changing when the mouse moves over it*, we also wanted a message to appear next to each image to identify it. For example, if the mouse moves over the first image, the message "This is a mouse." should appear in the page beside that image, and disappear when the mouse moves away. Rewrite the first IMG element below to include this *additional* behavior.