

Section 1: HTML [14 points]

1- (6 points) write the HTML code to generate the following table:

Alpha	Beta				
	Gamma	Tilde		Lambda	
		1	2	3	4
	Zeta	Delta		Theta	
		Omega		Kappa	

```
<table border=1>
<tr> <th rowspan=5>alpha</th><th colspan=5>Beta</th></tr>
<tr><th rowspan=2>Gamma</th><th colspan=2>tilde</th>
      <th colspan=2>Lambda</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><th rowspan=2>Zetta</th><th colspan=2>Delta</th><th colspan=2>Theta</th></tr>
<tr><th colspan=2>Omega</th><th colspan=2>Kappa</th></tr>
</table>
```

2- (4 points) Write the HTML code to generate the following using lists:

- a. Alpha
- b. Beta
- c. Gamma
 - i. Tilde
 - ii. Lambda
 - iii. Omega
- d. Zeta

```
<ol type="a">
<li> Alpha</li>
<li> Beta</li>
<li>Gamma</li>
  <ol type ="i">
    <li> Tilde</li>
    <li> Lambda</li>
    <li> Omega</li>
  </ol>
<li>Zeta</li>
</ol>
```

3- (4 points) Write a style sheet that expresses that H1 should always be centred and in italic, while H2 should always be red.

```
<STYLE TYPE="text/css">
<!--
H1 {font-style: italic; text-align: center;}
H2 {color: red;}
-->
</STYLE>
```

Section 2: Multiple choice [30 points]

(2 points each for correct answer, -1 for wrong answer)

Circle exactly ONE choice as the best answer to each question.

1- HTML is based on:

- a) XML;
- b) SGML;**
- c) LaTeX;
- d) HTTP;
- e) HHML.

2- JavaScript can be used:

- a) Only on the client side;
- b) Only on the server side;
- c) On both server and client sides.**

1 point for answer (a)

3- Java can be used:

- d) Only on the client side;
- e) Only on the server side;
- f) On both server and client sides.**

4- Perl can be used:

- g) Only on the client side;
- h) Only on the server side;**
- i) On both server and client sides.

5- The Memex machine is:

- a) A photocopier machine;
- b) A machine for cassette tapes;
- c) A machine invented by Tim-Berners Lee;
- d) A hypothetical machine for Latex;
- e) Part of a dream of a visionary.**

6- The tag in HTML is:

- a) For expressing a new style for part of a document;**
- b) For filtering bad messages;
- c) To define the width of text;
- d) To redefine the unit of measure for fonts;
- e) The tag does not exist.

7- The tags <LAYER> and <DIV> in HTML:

- a) Are always interchangeable to define a CSS layer;
- b) Are both recognized by Netscape;
- c) Are both recognized by Internet Explorer;
- d) Internet Explorer accepts only the tag <LAYER>;
- e) Netscape accepts only the tag <LAYER>.**

2 points for answer (b)

8- Sending the HTTP request

http://myserver/myprog.cgi?var1=4&var2=5 is:

- a) Equivalent to submitting a form with a GET;**
- b) Equivalent to submitting a form with a POST;
- c) Will generate an error because '&' is a reserved character;
- d) var1 and var2 will be ignored.

9- DHTML is:

- a) A combination of HTML, Cascading Style Sheets and JavaScript;**
- b) HTML that is generated on the fly;
- c) HTML that changes dynamically;
- d) HTML that is based on the DOM (document object model);
- e) A special HTML that works only with Internet Explorer.

10- In Perl a variable @myVar is:

- a) A variable containing an e-mail address;
- b) A float variable;
- c) An associative array;
- d) An array.**

11- The expression in Perl

- s/abc/xyz/ig**
- a) Substitutes the first “abc” with “xyz”;
 - b) Substitutes all “abc” with “xyz”;
 - c) Searches for words that start with “abc” and end with “xyz”;
 - d) Substitutes all “abc” lower or upper case with “xyz”;**
 - e) Substitutes “abc” and “xyz” with “ig”;
 - f) Would generate a syntax error in Perl.

1 point for answer (b)

12- In Perl, the statement

- abc=(xyz>3)? 10: 20**
- a) Is incorrect and will generate a syntax error;**
 - b) Assigns 10 to abc if xyz is greater than 3 and 20 otherwise;
 - c) Reads the first 10 characters of a string abc until it reaches the substring xyz at the 20th position + or – 3 characters;
 - d) This statement doesn’t make sense;
 - e) Substitutes “xyz” with “abc” between the positions 10 and 20.

13- The following statements:

- ```
if (-e "abc") {
 open(A, "<abc");
 @xyz=<A>;
 foreach $ig (@xyz) print $ig;
}
```
- a) Prints all characters of a string abc;
  - b) Prints all lines of a file abc;**
  - c) Prints the first line of a file abc;
  - d) Test the existence of a file abc in a directory;
  - e) Converts all lines of a file abc in uppercase then prints them;
  - f) Generates messages for a mailing list.

**14- Data Mining is:**

- a) A technique to find efficiently information in a database;
- b) A novel approach for indexing very large databases;
- c) The extraction of hidden patterns from large collections of data;**
- d) Transformation of data in a database into a more understandable form;
- e) A buzzword used in marketing but irrelevant in databases.

*1 point for answer (a)*

**15- In Perl, the statement**

- If (\$myString =~ /hello\$)**
- a) Compares the variable myString and the variable hello;
  - b) Compares the variable myString with the string “hello”;
  - c) Returns true if the string “hello” matches the end of the string variable myString;**
  - d) Returns true if the string variable myString contains the substring “hello”;
  - e) Compares if both strings are approximately equal.

### Section 3: General Questions [21 points]

1- [3 points] Explain briefly what is an Intranet.

The Intranet refers to a connection of networks within an organization. This network typically has web capability and could be connected to the Internet via a gateway.

2- [3 points] Explain the packet switching with TCP/IP

See slide 11 of lecture 3.  
Message broken up in packets. Each is encapsulated and sent independently. The packets are received, stripped from their envelope and put together to get the original message back.

3- [3 points] Explain the syntax of a uniform resource locator.

See slide 26 lecture 3

- 4- [4 points] Explain briefly what a recommender system is and give a simple example in the context of a web-based e-commerce application.

A recommender system is a system that automatically suggests possible actions, choices or resources to a user based on the analysis of the access patterns, general on-line behaviour, and profile of the user or user community.  
 An example of recommender system would be a software agent that would suggest possible products or services that the on-line user could consider purchasing based on the user's purchasing history and the sales choices of other similar consumers.

- 5- [8 points] Write in pseudo-code a procedure to parse input data of a CGI program and put the result in two arrays variables[1..n] and values[1..n]. The procedure is for both methods POST and GET.

```

Input: environment variables REQUEST_METHOD and QUERY_STRING
Output: variables[1..n] and Values[1..n]
Algorithm:

InputString ← <STDIN> if REQUEST_METHOD == 'POST'
InputString ← QUERY_STRING if REQUEST_METHOD == 'GET'
n=0
Split InputString into entries based on separator '&'
Split each entry into variable and value based on separator '='
 n ← n+1
 put variable in variable[n]
 clean value by eliminating end spaces and replacing escape
sequences by their evaluation
 put clean value in values[n]

```

## Section 4: Perl Pattern matching and Validation with Javascript [35 points]

1- (Perl Total 14 points) Consider the following text file named students.txt:

```
Corey Nelson 101
Calvin Chan 221
Curt Mastaller 321
Guoling Zhang 441
Victor Salomon 541
Billy Yeung 651
```

a) [2 points] What is the output of the following command:

```
perl -ne 'print if /[A-Z][a-z]rt/' students.txt
```

**Output**

```
Curt Mastaller 321
```

b) [2 points] What is the output of the following command:

```
perl -ne 'print if /^[^1234]0/' students.txt
```

**Output**

```
Empty (no output)
```

c) [2 points] What is the output of the following command:

```
perl -ne 'print if /5\d\d/' students.txt
```

**Output**

```
Victor Salomon 541
```

d) [2 points] What is the output of the following command:

```
perl -ne 'print if /[BC]\D/' students.txt
```

**Output**

```
Corey Nelson 101
Calvin Chan 221
Curt Mastaller 321
Billy Yeung 651
```





a) [6 points] Write a JavaScript function and indicate the changes in the form such that only digits and “.” are allowed when entering “first”, “second” and “third” and when the value is correct the corresponding checkbox is selected.

```
function verify(textfield) {
 field= eval("document.myf.var"+textfield);
 box=eval("document.myf.cb"+textfield);
 expression=/^[0-9]*\.[0-9]*$/
 if (expression.test(field.value)) {
 box.checked=true;
 }
 else {
 window.alert(field.value + " is not valid.");
 field.focus();
 }
}
```

```
First : <INPUT name="var1" TYPE="text" size=20
onChange="verify(1)">
<INPUT name="cb1" TYPE="checkbox" >

Second : <INPUT name="var2" TYPE="text" size=20
onChange="verify(2)">
<INPUT name="cb2" TYPE="checkbox" >

third : <INPUT name="var3" TYPE="text" size=20
onChange="verify(3)">
<INPUT name="cb3" TYPE="checkbox" >

```

b) [5 points] Write a JavaScript function and indicate the changes in the form such that when a checkbox is unselected the corresponding value is reset to 0.

```
function check (textfield) {
 field= eval("document.myf.var"+textfield);
 box=eval("document.myf.cb"+textfield);
 if (box.checked==false) {field.value='0'; }
}
```

```
First : <INPUT name="var1" TYPE="text" size=20
onChange="verify(1)">
<INPUT name="cb1" TYPE="checkbox" onClick="check(1)">

Second : <INPUT name="var2" TYPE="text" size=20
onChange="verify(2)">
<INPUT name="cb2" TYPE="checkbox" onClick="check(2)">

third : <INPUT name="var3" TYPE="text" size=20
onChange="verify(3)">
<INPUT name="cb3" TYPE="checkbox" onClick="check(3)">

```

c) [5 points] Adjust you JavaScript code such that the sub-total, the tax and the total are calculated whenever a value is changed:

```
function calculate() {
 subtotal= 0;
 subtotal+=1*document.myf.var1.value;
 subtotal+=1*document.myf.var2.value;
 subtotal+=1*document.myf.var3.value;
 document.myf.stot.value=subtotal;
 document.myf.tax.value=subtotal*0.07;
 document.myf.tot.value=subtotal*1.07;
}
```

Add

```
calculate();
```

at the end of function check()

Add

```
Calculate();
```

In function verify() in the if statement:

```
if (expression.test(field.value)) {
 box.checked=true;
 calculate();
}
```

d) [5 points] Change your code such that the values are always two digits after the decimal point.

```
function twodec(field) {
 x=field.value;
 x=x*100; y=Math.abs(x); x=y/100;
 field.value=x;
}
```

Add

```
twodec(document.myf.tot);
```

at the end of calculate() function.