## Section A: Multiple Choice Questions (30%)

1. Which primitive shape is supported by <canvas>? (2%)
   A. Circle
   B. Rectangle
   C. Polygon
   D. Triangle

2. How does a FOR loop start? (2%)
   A. for (i <= 5; i++)
   B. for (i = 0; i <= 5)
   C. for i = 1 to 5
   D. for (i = 0; i <= 5; i++)

3. If you wanted to round the corners of a block element, which style property would you apply? (2%)
   A. border:
   B. border-arc:
   C. border-deg:
   D. border-radius:

4. From outside to inside, a box (block) has: (2%)
   A. border, margins, padding
   B. margins, padding, border
   C. padding, margins, border
   D. margins, border, padding

5. How do you select all <p> elements that are sibling of an <h2> element? (2%)
   A. h2.p
   B. h2~p
   C. h2+p
   D. h2*p

6. How do you find the number with the highest value of x and y? (2%)
   A. ceil(x, y)
   B. max(x, y)
   C. Math.max(x, y)
   D. top(x, y)

7. What will the following code return: Boolean(10 > 9). (2%)
   A. true
   B. NaN
   C. false

8. Which protocol is ideal for transmitting large files? (2%)
   A. HTTP

B.  FTP
C.  SMTP
D.  RTP

9. Indicate whether each of the following statements is True or False (1% each - 8%)

a)  External JavaScript files can be linked using the <link> element.
    False

b)  Variable names in JavaScript are case sensitive.
    True

c)  JavaScript can be turned off by users.
    True

d)  JavaScript can appear in both <head> and <body> sections.
    True

e)  HTML allows constructs that are not permitted in XHTML.
    True

f)  XML documents must have a root element
    True

g)  The margin is affected by the background color of the box
    False

h)  <_Element1> is a valid XML tag.
    True

10. Answer the following questions. (2% each - 6%)

var temp = 81;
var willRain = true;
var humid = (temp > 80 && willRain == true);

A. What is the value of humid? _____ True

var guess = 6;
var isValid = (guess >= 0 && guess <= 6);

B. What is the value of isValid? _____ True

var kB = 1287;
var tooBig = (kB > 1000);
var urgent = true;
var sendFile = (urgent == true || tooBig == false);

C. What is the value of sendFile? _____ True

## Section B: Longer Answer Questions (30%)

1. You're creating a music web site with the following folder and file structure:

```
music/
     index.html
     format/
          cd-used.html
          cd-new.html
     genre/
          rock/
               classic/
                    doors.html
                    stones.html
               punk/
                    ramones.html
                    sex-pistols.html
          rap/
               icecube.html
               DMX.html
```

Give the relative URL for each of the following connections (1.5% each - 6%):

A. From cd-used.html to stones.html (1.5%)
../genre/rock/classic/stones.html

B. From icecube.html to ramones.html (1.5%)
../rock/punk/ramones.html

C. From doors.html to stones.html (1.5%)
stones.html
D. From index.html to DMX.html (1.5%)
genre/rap/DMX.html


2. Name each of the 4 layers of the TCP/IP model and very briefly (one sentence) state the purpose of each part (6%).

• The Application layer provides applications the ability to access the services of the other layers and defines the protocols that applications use to exchange data, includes protocols such as the HyperText Transfer Protocol (HTTP) and the Domain Name System (DNS).
• The Transport Layer is responsible for making sure that complete messages are delivered end to end, using the Transmission Control Protocol (TCP) or User Datagram Protocol (UDP).
• The Network/Internet Layer is responsible for routing messages from one place to another; all routers on the Internet run the IP protocol.

3. What is the result of the following code? (3%)

```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript do ... while</h2>

<p id="demo"></p>

<script>
var text = ""
var i = 0;

do {
    text += "<br>The number is " + i;
    i++;
}
while (i < 10);

document.getElementById("demo").innerHTML = text;
</script>

</body>
</html>
```

The number is 0
The number is 1
The number is 2
The number is 3
The number is 4
The number is 5
The number is 6
The number is 7
The number is 8
The number is 9

4. What is the result of the following code (when the user clicks the button)? (3%).

```
<!DOCTYPE html>
<html>
<body>

<p>Click the button to loop through the indices of an array named "cars".</p>

<button onclick="myFunction()">Try it</button>
```

```
<p id="demo"></p>

<script>
function myFunction() {
    var cars = ["BMW", "Volvo", "Saab", "Ford"];
    var i;
    for (i = 0, len = cars.length, text = ""; i < len; i++) {
        text += cars[i] + "<br>";
    }
    document.getElementById("demo").innerHTML = text;
}
</script>

</body>
</html>
```

<span style="color:red">BMW</span>
<span style="color:red">Volvo</span>
<span style="color:red">Saab</span>
<span style="color:red">Ford</span>

5.  What is the result of the following code (when the user clicks the button)? (3%)

```
<!DOCTYPE html>
<html>
<body>

<p>Click the button to do a loop which will skip the step where i is equal to 3.</p>

<button onclick="myFunction()">Try it</button>

<p id="demo"></p>

<script>
function myFunction() {
    var text = "";
    var i;
    for (i = 0; i < 5; i++) {
        if (i === 3) {
            continue;
        }
        text += "The number is " + i + "<br>";
    }
    document.getElementById("demo").innerHTML = text;
}
</script>

</body>
</html>
```

6. Write the appropriate position property value for each of the following descriptions (1% each - 4%)

   A. This is the default setting – no special positioning.
   Static

   B. The box is taken out of normal flow and no longer affects the position of the other elements.
   Absolute

   C. This property value moves an element in relation to where it would have been in normal flow.
   Relative

   D. Configures the location of an element within the browser viewpoint – i.e. the element doesn't change position if scrolling content.
   Fixed

7. Explain the key differences between Canvas and SVG, no need to write more than 4-5 bullet points (5%).

   - In Canvas elements are drawn programmatically while in SVG are parts of the page's DOM
   - In Canvas drawing is done with pixels while in SVG is done with vectors.
   - In Canvas animations are not built-in while in SVG animations are built-in
   - Canvas has high performance for pixel-based drawing operations while SVG is based on standard XML syntax, which provides better accessibility

## Section C: Coding Related Questions (40%)

Note that your code need not match our code exactly. We would be shocked if it did! The solutions are just few of many ways to solve the problems. Capturing the ideas is what's important.

1. Use JavaScript to compute the height of a tree after some number of years after you buy it. You buy it as a sapling that is 2 meters high, and we predict that the tree will grow 1 meter per year. Write some JavaScript code that does the following:
A. Asks the user for the number of years into the future they want to know the height of a tree. (4%).
B. Informs the user about the predicted height. (4%).

```
var height0 = 2;
var slope = 1;
var years = prompt("how many years?");
var height = slope*years + height0;
```

alert("in "+years+" years, it will be "+height+" feet high");

2. Create a CSS rule that targets the class named "cities". Add the following styles (4%):
- black background color
- white text color
- 20 pixels padding

```
<!DOCTYPE html>
<html>
<head>
<style>
.
.
.
<style>
</head>
<body>

<div class="cities">
  <h2>London</h2>
  <p>London is the capital city of England. It is the most populous city in the United Kingdom, with a metropolitan area of over 13 million inhabitants.</p>
  <p>Standing on the River Thames, London has been a major settlement for two millennia, its history going back to its founding by the Romans, who named it Londinium.</p>
</div>

</body>
</html>
```

```
<style>
.cities {
    background-color:black;
    color:white;
    padding:20px;
}
</style>
```

3. Create a button (using input types) that says "Click Me", which alerts "Hello World" when you click on it. (4%)

```
<!DOCTYPE html>
<html>
```

```html
<body>

<input type="button" onclick="alert('Hello World')" value="Click Me">

</body>
</html>
```

4. Consider the following HTML:

```html
<!DOCTYPE html>
<html>
<head>
<style>

</style>
</head>
<body>

<h1>This is a Heading</h1>
<p>This is a paragraph.</p>
<p class="highlight">This is another paragraph.</p>

</body>
</html>
```

Write the CSS (can also be Pseudo-Classes, Pseudo-Elements) needed to (12% - 3% each):

A. Change the background color, when a user hovers over p elements, with the class "highlight", to "lightblue".

```css
p.highlight:hover {

    background-color: lightblue;
```

B. Set text color to "red", and the text size to "xx-large", for the first letter of the <p> element.

```css
p::first-letter {

    color: red;

    font-size: xx-large;

}
```

C. Insert the image "smiley.gif" before, and after <p> elements.
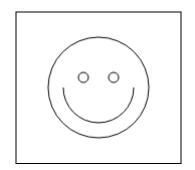
```css
p::before{

    content: url(smiley.gif);

}
```

D. With the border property: Set the border for p to "10px", "solid" and "green".

5. Write some JavaScript that uses the current time and tells whether class is over (class ends 12:20). (5%)

6. Write JavaScript code to draw the following figure inside a <canvas> element:

Don't forget to access the canvas element from your script and use the 2D drawing API. We expect you to approximately draw the following figure, eg. bigger eyes, face not centered to the canvas etc. are not problems. (7%)



```
<!DOCTYPE html>
<html> <body>
<canvas id="myCanvas" width="150" height="150" style="border:1px solid #d3d3d3;">
Your browser does not support the HTML5 canvas tag.</canvas>

<script>
…

</script>
</body> </html>
```

Solution

```html
<!DOCTYPE html>
<html>
<body>
<canvas id="myCanvas" width="150" height="150" style="border:1px solid #d3d3d3;">
Your browser does not support the HTML5 canvas tag.</canvas>
<script>
window.onload = function() { //execute after page has been loaded
var canvas = document.getElementById("myCanvas");
if (canvas && canvas.getContext) { //do we have Canvas object & method getContext
var ctx = canvas.getContext("2d"); //gets us to the drawing 2D api
if (ctx) {
// Draw shapes
ctx.beginPath();
ctx.arc(75,75,50,0,Math.PI*2,true); //Outer cicle
ctx.moveTo(110,75);
ctx.arc(75,75,35,0,Math.PI,false); //mouth
ctx.moveTo(65,65);
ctx.arc(60,65,5,0,Math.PI*2,true); //left eye
ctx.moveTo(95,65);
ctx.arc(90,65,5,0,Math.PI*2,true);
ctx.stroke();
}}}

</script>
</body>
</html>
```