First Name (PRINT):___________________________________________________

Last Name (PRINT):___________________________________________________

University ID:________________________________________________________________

I pledge on my honor that I have not given or received any unauthorized assistance on this examination.

Your signature:_________________________________________________________________

Instructions (Read the instructions before proceeding)

- This exam is a closed-book and closed-notes exam.
- Total point value is 100 points.
- Duration is 50 minutes.
- Please use a pencil to complete the exam.
- For those questions requiring JavaScript code just provide what should appear in between the <script> and </script> tags.
- WRITE NEATLY. If we cannot understand your answer, we will not grade it (i.e., 0 credit).

<table>
<thead>
<tr>
<th>#1</th>
<th>Miscellaneous</th>
<th>(40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#2</td>
<td>JS (Loops)</td>
<td>(20)</td>
</tr>
<tr>
<td>#3</td>
<td>JS (One-Dimensional Arrays)</td>
<td>(20)</td>
</tr>
<tr>
<td>#4</td>
<td>Forms/DOM</td>
<td>(20)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>(100)</td>
</tr>
</tbody>
</table>
Problem 1, Miscellaneous (40 pts)

1. (2 pts) The += operator allows to
   a) Append strings √
   b) Multiply strings
   c) Appends two strings adding an additional space at the end
   d) None of the above

2. (2 pts) In HTML5 we could replace <div id="header"> with
   a) <mainHeader>
   b) <subHeader>
   c) <header>√
   d) None of the above

3. (2 pts) The value of the expression “20” === 20 is:
   Note: notice we are using three = above
   a) true
   b) false √
   c) undefined
   d) None of the above

4. (2 pts) We can validate the data associated with a form by recognizing the submit event.
   a) True √
   b) False

5. (2 pts) Which of the following is considered an event in JavaScript?
   a) Generating a random number
   b) Loading a web page √
   c) An infinite loop
   d) None of the above

6. (2 pts) While accessing a form, you notice that if you try to reload the form you get a warning indicating the last operation performed will be repeated. This indicates the method associated with the form is:
   a) post √
   b) get
   c) both post and get
   d) None of the above

7. (2 pts) Server side includes allow us to:
   a) Avoid code duplication by allowing us to include the same code in multiple files √
   b) Send images to web servers
   c) Change to HTML5 display mode
   d) None of the above

8. (2 pts) Which of the following represents an example of an iframe?
   a) The facebook “Like” button √
   b) Any web page
   c) Web pages with JavaScript
   d) None of the above
9. (2 pts) The `<label>` tag is used during the definition of forms.
   a) True  
   b) False

10. (2 pts) Infinite loops are only possible in for loops.
    a) True
    b) False

11. (2 pts) The order in which pseudo-classes associated with links are specified is not important.
    a) True
    b) False

12. (2 pts) In JavaScript null and undefined represent the same value.
    a) True
    b) False

13. (2 pts) EcmaScript is the language JavaScript and ActionScript implement.
    a) True
    b) False

14. (2 pts) Provide an expression that generates NaN.
    (2 pts) For an expression generating NaN. Examples: Math.sqrt(-15).

15. (2 pts) Which of the following functions allow us to access the DOM (circle all those apply)?
    a) document.alert
    b) document.getElementById
    c) document.src
    d) None of the above

16. (2 pts) A class selector allows us to apply the same CSS rules to different elements.
    a) True
    b) False

17. (2 pts) Using the script tag, define a directive that includes the file “myCode.js” in your html.
    <script src="myCode.js"></script>

18. (2 pts) In JavaScript (circle all those applies):
    a) Functions are objects
    b) Functions are not objects; they are similar to C functions
    c) Functions can be passed to other functions and returned from functions
    d) None of the above

19. (4 pts) Define a CSS rule that defines all paragraphs to have a green color and a font size of 3em.
    p {
    font-size: 3em; color: green;
    }
    (2 pts) p {
    font-size: 3em; color: green;
    }
Problem 2. JavaScript (DHTML) (20 pts)

Write a JavaScript program that prints a table with the square roots of **odd** numbers between two specified values. The program will read the two values from the user by using prompt and the message “Enter Value”. For example, if the user enters 3 and 7 the table will be:

<table>
<thead>
<tr>
<th>Number</th>
<th>Square Root</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1.7320508075688772</td>
</tr>
<tr>
<td>5</td>
<td>2.23606797749979</td>
</tr>
<tr>
<td>7</td>
<td>2.6457513110645907</td>
</tr>
</tbody>
</table>

The program should work for values other than 3 and 7. Use the function Math.sqrt to compute square roots (e.g., square of 3 → Math.sqrt(3)). For this problem, you only need to write the JavaScript code (i.e., you don’t need to specify <head>, <body>, <script>, etc.)

Answer:

```javascript
var lowerLimit = prompt("Enter value");
var upperLimit = prompt("Enter value");
document.writeln("<table border="1"">");
document.writeln("<tr><th>Number</th><th>Square Root</th></tr>");
for (x = lowerLimit; x <= upperLimit; x++) {
    if (x % 2 !== 0)
        document.writeln("<tr><td>" + x + "</td><td>" + Math.sqrt(x) + "</td></tr>");
}
document.writeln("</table>");
```
Problem 3, JavaScript (One-Dimensional Arrays) (20 pts)

Write a JavaScript function that has the prototype below. The function will return a new array with the absolute value of the elements in the data array. The original array (data) should not be modified. For example, the following code fragment will show 4,6,12. If the data array has a size of 0, the function will not create an array and will return null.

```javascript
var a = [-4, 6, -12];
alert(computeAbs(a));
```

The following information applies to this problem:

- You may not modify the array parameter.
- You only need to write the function (no need for <head>, <body>, <script>, main, etc.).
- The function does not read any data (i.e., it may not have any prompt statements).
- The function does not print any data (i.e., it may not have document.writeln or alert).
- The function must work for arrays of any length.
- Use the Math.abs function to compute absolute values (e.g., Math.abs(-4) → 4)

Answer:

```javascript
function computeAbs(data) {
    if (data.length == 0)
        return null;
    else {
        var result = new Array(data.length);
        for (idx = 0; idx < data.length; idx++) {
            result[idx] = Math.abs(data[idx]);
        }
        return result;
    }
}
```
Problem 4, Forms/DOM (20 points)

For this problem, you will complete the code (HTML and JavaScript) associated with a form (a snapshot is provided below) that computes squares (e.g., $3 \rightarrow 9$). When the user clicks on the “Process Data” button, the square of the number provided will be displayed only if the value is a number between 1 (inclusive) and 100 (inclusive). If an invalid value is provided, the message “Invalid data” will be displayed. You can assume the user will always provide a number. Use alert to generate any output. The “Clear” button will reset the form.

Enter Value [ ] Process Data Clear

```html
<body onload = "main()">
<form>
  <!-- You must complete -->
</form>
<script>
  function main() {
    /* You must complete */
  }

  function computeSquare() {
    /* You must complete */
  }
</script>
</body>
```

Answer:

```html
<body onload = "main()">
<form>
  Enter Value
  <input type="text" id="myTextField" />
  <input type="button" id="displayValueButton" value="Process Data" />
  <input type="reset" value="Clear" />
</form>
<script>
  function main() {
    var displayButtonInHTMLForm = document.getElementById("displayValueButton");
    displayButtonInHTMLForm.onclick = computeSquare;
  }

  function computeSquare() {
    var myTextFieldInHTMLForm = document.getElementById("myTextField");
    var value = Number(myTextFieldInHTMLForm.value);
    if (value < 1 || value > 100) {
      alert("Invalid value");
    } else {
      alert(value * value);
    }
  }
</script>
</body>
```