SSN COLLEGE OF ENGINEERING
M.E. (Computer Science and Engineering) Semester 2
Assignment: 2 (23 March 2019)

Time: 9.50–11.30 **PCP1202 Web Application Development** Max marks: 50

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## Part A

$14 \times 2 = 28$

Answer *all* questions.

1. Write one line of JavaScript code to create a `point` object with three properties `x, y, z` with initial values `5, 10` and `15`, respectively.
2. What is the output and what is the type conversion rule used, in each case?
   (a) `console.log('5' - 2)`
   (b) `console.log('5' + 2)`
3. What is printed?

```
var a = {font: "roman", size: "10", color: "red",};
var b = a;
b["color"] = "green";
console.log(a);
```

4. Write a loop in JavaScript to print the property names and their values of the object `a` in the question.
5. What is the data type array index in JavaScript? If we use a number to index an array element, how is it handled?
6. Explain the scope rules in JavaScript.
7. Write a regular expression in JavaScript for phone numbers of the form 91-44-22294254
8. Write a regular expression in JavaScript for dates of birth of the form 16-12-1961.
9. Write JavaScript code that stores in a variable the median of an array containing odd number of integers.
10. What is DOM? State its purpose.
11. Compare the two methods of accessing the style properties in DOM:
    (a) `element.style.setProperty('background-color', 'silver')`
    (b) `element.style.backgroundColor = 'silver'`
12. How can we find our whether a `Node` object is an `Element` object?
13. What is an *event listener*? How is it defined?

14. Distinguish between *static* web page and a *dynamic* web page from the web server's point of view.

## Part B

$6 \times 10 = 60$

Answer any *three* questions.

15. (a) Describe how object constructors, with properties and methods, can be implemented in JavaScript?

    (b) What is the syntax and meaning of `new` operator in JavaScript?

    (c) What is the output of executing the following JavaScript program?

```
function test(obj) { obj.j = 3; }
var o1 = new Object();
o1.j = 2;
var o2 = o1;
test(o2);
console.log(o1.j)
```

    (d) What is the output of executing the following JavaScript program? Explain why this output is produced.

```
function rusty(a) { this.x = a; }
var o1 = new Object();
var o2 = new Object();
o1.rusty = rusty;
o2.rusty = o1.rusty;
o1.rusty(1);
o2.rusty(2);
console.log(o1.x + ", " + o2.x);
```

16. (a) Describe the following DOM objects, their important proerties and methods: (i) Node (ii) Document (iii) Element

    (b) Write a JavaScript program to print the outline of the tree structure of the elements of a HTML document.

17. (a) State the properties of `Event` object in DOM and their purpose.

    (b) Suppose a HTML document contains a `button` element whose `id` attribute is assigned `msgButton`. Write an event listener that, whenever the button is clicked, displays an `alert` box with the properties of the `Event` object.

    (c) Suppose an event on an element has a number of event listeners: capturing, target, and bubbling. Describe how an event listener is selected for an event occurring on the element.

18. (a) Write a JS program to randomly display an image from an image pool.

    (b) Use a one-dimensional array and write a script to solve the following problem: Read in 20 numbers, each of which is between 10 and 100. As each number is read, print it only if it is not a duplicate of a number that has already been read.

19. (a) Implement a bank account object constructor `BankAccount`, with suitable arguments. It should have the properties `accountNumber` and `balance`.

    (b) Add the following methods to the `BankAccount` object.

    - `deposit(amount)`: it should add the `amount` argument to `balance` of the `BankAccount` object and return the resulting `balance`.
    - `withdraw(amount)`: it should subtract `amount` from `balance` of the `BankAccount` object, and return the resulting `balance`. It should check whether the account has sufficient balance before withdrawal.

20. With suitable examples, explain in detail DOM event handling (event generation, event listener, event propagation, event canceling).

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