FOP Mock Test

Disclaimer: This paper is NOT an actual mock paper set by the school; it is set by AY24/25 SOC Sophomore Students based on their prior knowledge on previous year FOP MST. The purpose of the mock paper is to share with the students certain questions which they should take note of as well as higher order thinking questions. No lecturer was involved in the making of this paper. Certain topics are not covered. Please refrain from using any IDEs (VSCode, atom, notepad++, notepad, dreamweaver).

Please note: Difficulty increases as the question number gets larger

PART 1

1. Which of the methods are valid ways of declaring a variable? (possibly more than 1)

```
1   let num1 = 1;
2   int num2 = 1;
3   const num3 = 1
4   var num4;
```

   a) 1 and 2
   b) Only 1
   c) Only 4
   d) 1, 3 and 4. (d)

2. How many times will this for-loop console.log?

```
for (int i = 0; i < 5; i++) {
    console.log();
}
```

   a. 5
   b. 4
   c. 6
   d. Error (a)

3. Which of the following is the correct way to declare an array?

```
1   const num0 = {1, 2, 3};
2   var num1 = [1, 2, 3];
3   int[] num2 = [1, 2, 3];
4   let num3 = new Array()[1, 2, 3];
```

   a. 4 and 3
   b. 3 and 1
   c. 2
   d. All of the above (c)

4. Which of the following are valid identifiers?

```
1   var new = [0, 1, 2, 3];
2   var $1 = [0, 1, 2, 3];
3   var nums 123 = [0, 1, 2, 3];
4   var _ = [0, 1, 2, 3];
```

   a. 1
   b. 2 and 4
   c. 3
   d. None of the above (b)

5. What is the output of the following code?

```
var x = 23;
x += x++ - --x + x * 2 - ++x;
console.log(x);
```

   a. 49
   b. 45
   c. 54
   d. 41 (b)

6. What is the output?

```
var i = 0;
do {
    i++;
    i += --i;
    i += 10;
    --i;
    i ** 2 + 3;
    --i;
    i -= 5;
    i **= 3;
    i += 5;
} while (i == 0);
console.log(i);
```

   a. 0
   b. 69
   c. 5
   d. Undefined (b)

7. What is the output?

```
var i = 5;

function change() {
  i = 6;
}
console.log(i);
```

   a. 5
   b. 6
   c. undefined
   d. None of the above (a)

8. What is the output of the following code?

```
console.log(Math.abs(4/8 * 1/4 + 0.875 - 10));
```

   a. 9
   b. 3.125
   c. -9
   d. 8.75 (a)

9. What is the minimum and maximum value (inclusive) of this Math.random() statement?

```
1   console.log(Math.floor(Math.random() * 100));
```

   a. 0, 99
   b. 1, 10
   c. 50, 101
   d. 1, 100 (a)

10. What is the output?

```
1   let i = 1;
2
3   while (i < 9) {
4       i += 4;
5   }
6
7   console.log(i);
```

   a. 8
   b. 9
   c. 13
   d. 10 (b)

11. What is the output?

```
1   console.log("yes" || "no");
```

   a. true
   b. false
   c. yes
   d. no (c)

12. What is the output?

```
1   console.log(!true || (false && true && true) || true);
```

    a. true
    b. false
    c. error
    d. no (a)

13. What is the output?

```
var i = 5;

function change() {
  var i = 6;
  i++;
  i++;
}
console.log(i);
```

    a. 6
    b. 7
    c. 5
    d. 8 (c)

14. What is the output?

```
1   console.log("Chick\en");
```

    a. Chicken
    b. chicken
    c. chickn
    d. Chick (d)

15. What is the output?

```
1   let arr = [0, 1, 2, 3, 4, 5];
2
3   console.log(arr.pop());
```

    a. 6
    b. 0
    c. 5
    d. 7 (c)

16. What is the output?

```
var i = 4;

function change() {
  var i = 8;
}

change();
console.log(i);
```

a. 4
b. 8
c. error
d. undefined (a)

17. What is the output?

```
let arr = [0, 1, 2, 3, 9, 8];
let a = arr.length;
console.log(arr[--a]);
```

a. 8
b. undefined
c. 9
d. 0 (a)

18. What is the output?

```
let list = [];
list[0] = 0;
list[1] = 3;

for (let i = 0; i < 10; i++) {
    if (i % 3 == 0) {
        list.push(i);
    }
}
console.log(list);
```

a. [0, 3, 6, 9]
b. [0, 3, 0, 3, 6, 9]
c. [3, 6, 9]
d. [0, 3] (b)

19. What is the output?

```
const x = 10;
x = 20;
console.log(x);
```

a. 10
b. 20
c. TypeError: Assignment to constant variable.
d. undefined (c)

20. What does the code do?

```
157
158  for (let i = 0; i < 13;i ++) {
159      if (i % 2 != 0 || i.toString().includes("2")) {
160          console.log(i)
161      }
162  }
```

a. Print numbers 0 to 13
b. Print all the numbers 0 to 12 that are odd or if the number has a 2 in it
c. If the number is odd, convert the number to a string and add 2 to it, then print.
d. Print all the numbers between 0 to 12 that are even or if the number has a 2 in it
(b)

21. What is the output?

```
1  if ("yes") {
2      console.log("Chickens are amazing!");
3  } else {
4      console.log("I love natto");
5  }
```

a. Chickens are amazing!
b. I love natto
c. error
d. Does not print anything (a)

22. What is the output?

```
1  console.log(true * 5 + 5);
```

a. truetruetruetruetrue5
b. true10
c. 10

d. error (c)

23. What is the output?(changed)

```
let i = 1;
const arr = [[1,2,3], [2,4,6], [3,6,9,12]];
console.log(arr[1 + i++][i++]);
```

a. undefined
b. 6
c. 12
d. 9 (d)

24. What is the output?

```
let chicken = 20.19;
let natto = 10;
if (typeof chicken === typeof natto) {
    console.log("same");
} else {
    console.log("not same");
}
```

a. same
b. not same
c. no output
d. error (b)

25. What is the output?

```
let str = "12345";
let arr = ["1", "2", "3", "4", "5"];
console.log(str[3] == arr[3]);
```

a. false
b. true
c. error
d. Does Not print anything (b)

26. What is the output?

```
let arr = [1, 2, 3, 4, 5, 6, 7, 8, 9];
let sum = 0;
for (var i = 0; i < arr.length; i++) {
    sum += arr[i];
    i += i + 2;
}
console.log(sum);
```

a. 45
b. 7
c. 8
d. 5 (d)

27. What is the output?

```
var i = 2;

function change() {
  i = 6;
}

change();
console.log(i);
```

a. 2
b. 6
c. undefined
d. Error (b)

28. What is the output?

```
1   for (var i = 0; i++ < 5; i++) {}
2   console.log(i);
```

a. 5
b. 7
c. Error – invalid for-loop at line 1
d. Error – i is not defined (b)

29. What is the output?

```
1   let arr = [1, 2, 1];
2   console.log(arr[arr[arr[2] - 1]]);
```

a. 1
b. 2
c. Undefined
d. null (a)

30. Which statements are true? (more than 1)

```
240   var input = require('readline-sync');
241   var count = input.questionInt("Enter your number");
242   do {
243       // point A
244       console.log("Hooray!");
245       count++;
246       // point B
247   } while (count < 100)
248   // Point C;
```

1. (count < 100) is always true at point A.
2. (count < 100) is always true at point B.
3. (count < 100) is always false at point C

4. If the user's input is 10, count's value is 100 at point C.

   a. Only 1
   b. 2 and 3
   c. Only 3
   d. 3 and 4 (d)

31. What is the output?(changed)

```
let rank = 3;

function printPrize(rank) {
    switch (rank) {
        case 1: PrizeMoney = 1000;
          break;
        case 2: PrizeMoney = 800;
          break;
        case 3: PrizeMoney = 700;
          break;
        case 4: PrizeMoney = 400;
        break;
        case 5: PrizeMoney = 300;
          break;
        default:PrizeMoney = 20;
    }
}

printPrize(rank);
console.log(PrizeMoney);
```

   a. 1000
   b. 700
   c. 20
   d. 400
   e. 720 (b)

32. What is the output?

```
for (let i = 0; i < 5; i++) {
    ("Inside the for loop!");
}
console.log(i);
```

   a. 5

b. Error – unknown expression “Inside the for loop!”
c. Error – i is not defined
d. 6 (a)

33. What is the output?

```
let maximum = 0;
for (let x = 0, y = 1; x + y < 5; x++, y+=2) {
    maximum = Math.max(maximum, x * y);
}
console.log(maximum)
```

a. 3
b. 10
c. 7
d. 5 (a)

34. What is the output?

```
let i = 'a'
for (let j = 0; i.length < 5; j++) {
    i += j;
}
console.log(i);
```

a. a
b. a1234
c. a01234
d. a0123 (d)

35. What is the output?

```
var out = "";
for (var x = 0; x <= 3; x++) {
    switch(x) {
        case 1:
            out += 1;
        case 2:
            out += 2;
            break;
        case 3:
            out += 3;
        default:
            out += 4;
            break;
    }
}
console.log(out)
```

a. 412234
b. 4123
c. 16
d. Error (a)

Part 2

1A) Write a function that takes an array of integers and returns the sum of all even numbers in the array. Use a for loop and an if-else statement

```
function sumOfEvenNumbers(arr) {
  //TO DO
}

console.log(sumOfEvenNumbers([1, 2, 3, 4, 5, 6])); // Output: 12
console.log(sumOfEvenNumbers([10, 11, 12, 13, 14, 15])); // Output: 36
```

1B) Write a function that takes an array of integers and returns the highest even number in the array. Use a for loop and an if-else statement

```
function highestEvenNumber(arr) {
  //TO DO
}

console.log(highestEvenNumber([1, 2, 3, 4, 5, 6])); // Output: 6
console.log(highestEvenNumber([10, 11, 12, 13, 14, 15])); // Output: 14
```

1C) Write a function that takes an array of integers and returns the second highest number in the array. Use a for loop and an if-else statement

```
function secondHighestNumber(arr) {
  //TO DO
}

console.log(secondHighestNumber([1, 2, 3, 4, 5, 6])); // Output: 5
console.log(secondHighestNumber([10, 11, 12, 13, 14, 15])); // Output: 14
```

2) Write a function that takes an array of positive integers and returns the length of the longest subarray where the sum of all elements is less than or equal to a given target

```
function longestSubarrayLength(arr, target) {
  //TO DO
}

// Example usage:
console.log(longestSubarrayLength([1, 2, 3, 4, 5], 9)); // Output: 3
console.log(longestSubarrayLength([3, 1, 4, 2, 2, 1, 1], 7)); // Output: 4
```

3) Write a function that takes two sorted arrays of integers and returns a new sorted array that contains all elements from both arrays without duplicates

```
function mergeSortedArrays(arr1, arr2) {
  //TO DO
}

console.log(mergeSortedArrays([1, 2, 3, 4, 5], [2, 4, 6, 8, 10])); // Output: [1, 2, 3, 4, 5, 6, 8, 10]
console.log(mergeSortedArrays([1, 1, 2, 3, 4], [2, 4, 4, 6, 8, 10])); // Output: [1, 2, 3, 4, 6, 8, 10]
```

4) Write a function that takes two strings as arguments and returns the largest substring that appears in both strings. The substring must be at least three characters long and must be made up of consecutive characters in both strings. For example, the string ‘ABCD’ has substrings ‘ABC’, ‘BCD’, and ‘ABCD’, but not ‘ACD’, because the characters are not consecutive

Do not use array methods like, indexOf, slice, substring or includes

```
114
115   findLargestCommonSubstring("ABCD", "BCDE"); // should return "BCD"
116   findLargestCommonSubstring("ABCD", "PQR"); // should return ""
117   findLargestCommonSubstring("ABCD", "CDEFG"); // should return "CD"
118   findLargestCommonSubstring("abcdefg", "defghijklmno"); // should return "def"
119
```

Hint: Make use of for and while loops

5) Ivan is rich and likes to eat food. One day, he is feeling very hungry and walks into a shop that sells only cookies and cake in bundles. Ivan can only eat 60 cookies and cakes in a meal(cannot exceed and need to have one of both) .
Display what is the maximum he can eat for a meal without exceeding his food limit.If it is not possible to buy both items without exceeding display “error” in the console.
Cookie and Cake is an array that contains integers.
Fill in the missing code.

EG 1:
Cookie = [2,9,5,1,8]
Cake = [8,31,40]
Expected_answer : 49
Explanation: 9 cookie and 40 cake

EG 2:
Cookie = [9,2,7,5,1,6]
Cake = [8,50,30]

Expected_answer : 59
Explanation: 9 cookie and 50 cake

EG 3:
Cookie = [60,52,57]
Cake = [9,11,20]
Expected_answer : error
Explanation : there’s no combination of cookie and cake that doesn't exceed 60

```
//max is to store the maximum cookies and cake that can be bought
max = 0
for(var i = 0 ; i< cookie.length;i++){
  for(var f = 0 ; f< cake.length;f++){
    if ( 5)i)                          &&   5)ii)                  >max){
      max = cookie[i]+cake[f]
    }
  }
}

if( 5)iii)       ){
  console.log("error")
}else{
  console.log(max)
}
```