CSC 1350 Pre-Exam # 2

Section (3/4)

October 10, 2019

NAME: _____

- Read the instructions before beginning the exam.
- Blue book is required. Fill in the information on the cover of your blue book and on the exam sheet.
- Answer all exercises in your blue book.
- Calculators are not allowed.
- Use the back of the exam sheets if you need scratch paper.
- Turn in the exam and your blue book before you leave.

DURATION: 80 Minutes

Table 1: Distribution of Points

PART	WORTH	SCORE
Written	100	/100

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

1 Exercises

Instruction: Read each question carefully before providing an answer.

A. Consider the array declaration below. Give the value of each expression.

```
int[] list = {1, 3, 1, 2, 1, 2, 0};
```

(a) **list[3]** [5 points]

(b) **list[1] + list[2]** [5 points]

(c) **list[list[0] + list[1]]** [5 points]

B. What would the code segment in *Listing* 1 output?

Listing 1: Code Segment

```
1  static final int SIZE = 7;
2  int[] sequence = new int[SIZE];
3  int i;
4  sequence[0] = 0;
5  sequence[1] = 1;
6  for (i=2; i<sequence.length; i++)
7     sequence[i] = sequence[i-1] + sequence[i-2];
8  System.out.println(Arrays.toString(sequence));
```

C. Consider the code segment in *Listing* 2. What would it output?

Listing 2: Code Segment

```
1  int i = 0, j;
2  while(i < 3)
3  {
4     j = 1;
5     while (j <= 3)
6     {
7        if ((i + j) % 2 == 0)
8           System.out.print("[0]");
9        else
10          System.out.print("[X]");
11       j++;
12    }
13    System.out.println();
14    i++;
15 }
```

D. What would the code segment in *Listing* 3 output? [15 points]

Listing 3: Code Segment

```
1   int n = 8;
2   int denom = 1;
3   int i = 2;
4   System.out.printf("pi[%d] = 4[1",n);
5   do
6   {
7      denom = denom + 2;
8      if (i%2 == 0)
9         System.out.printf(" - 1/%d",denom);
10     else
11        System.out.printf(" + 1/%d",denom);
12     i++;
13  }while(i <= n);
14  System.out.println("]");
```

E. What would the code segment in *Listing* 4 output?

Listing 4: Code Segment

```
1   int[] numbers = {1, 2, 3, 4, 5};
2   System.out.println(Arrays.toString(numbers));
3   int[] numbers2 = new int[2*numbers.length];
4   int i;
5   for (i = 0; i < numbers.length; i++)
6      numbers2[i] = numbers[i];
7   numbers = numbers2;
8   System.out.println(Arrays.toString(numbers));
9   for (i = numbers.length/2; i < numbers.length; i++)
10     numbers[i] = numbers[i - numbers.length / 2];
11  System.out.println(Arrays.toString(numbers));
```

F. Consider the code segment in *Listing* 5.

Listing 5: Code Segment

```
1     int i = 2;
2     System.out.printf("{%d ",i);
3     for (i = 4; i < 10; i++)
4     {
5        if (i % 2 == 0)
6           System.out.printf(" ,%d",i);
7     }
8     System.out.println("}");
```

(a) How many iterations will this code segment make?

(b) How many comparisons are made during the execution of this code segment? [3 points]

(c) What would the code segment output? [5 points]

(d) Rewrite the for-loop in the code segment without the use of the if-statement so that the output remains the same? [5 points]

(e) How many iterations will the revised version of the code segment make? [2 points]

(f) How many comparisons will the revised version of the code segment make? [3 points]

(g) Is the revised version more efficient than the original? Why or why not? [5 points]

G. Given a positive integer $n \geq 1$, write a loop that generates and computes the following alternating series. [5 points]

`1 - 2 + 3 - 4 + 5 - 6 + 7 ... n = ....`

H. What would the code segment in *Listing* 6 output?

Listing 6: Code Segment

```
1  int i;
2  for (i = 0; i < 9; i++)
3  {
4     int length = i + 1;
5     if (i >= 4)
6        length = 9 - i;
7     int j = 0;
8     while (j < length)
9     {
10       System.out.printf("%2d",j+1);
11       j++;
12    }
13    System.out.println();
14 }
```