

Name: _____

NetID: _____

Answer all questions in the space provided. Write clearly and legibly, you will not get credit for illegible or incomprehensible answers. This is a closed book exam. However, each student is allowed to bring one page of notes to the exam. Print your name at the top of every page.

Question:	1	2	3	4	5	6	Total
Points:	18	12	10	10	10	10	70
Score:							

1. Multiple choice questions

- (a) Which of the following is an integer type? (3)
A. `boolean` B. `char` C. `double` D. `float` E. `long`
- (b) If you wanted to store my cat's name in a variable, which of the following types would be best? (3)
A. `boolean` B. `char` C. `double` D. `int` E. `String`
- (c) If you wanted to store the number of cats in my house in a variable, which of the following types would be best? (3)
A. `boolean` B. `char` C. `double` D. `int` E. `String`
- (d) Which code could you use to create an array that could hold 50 integer values? (3)
A. `int values[50];`
B. `int[50] values;`
C. `int values = new int[50];`
D. `int values = new int(50);`
E. `int[] values = int[50];`
F. `int[] values = new int[50];`
G. `int[50] values = new array(int);`
- (e) What is the value of the following expression? `"one" + 2 + 3 * 4` (3)
A. `"one234"`
B. `"one212"`
C. `"one14"`
D. `15`
E. This expression would result in a compilation error.
- (f) Which of the following expressions would evaluate to 3.5? (3)
A. `7 / 2`
B. `(double)(7 / 2)`
C. `(double)7 / 2`
D. `7 / (int) 2.0`
E. `(int)(7.0 / 2.0)`

2. Why do the following code snippets not compile? (Explain in one sentence each.)

(a) _____ (3)

```
int x;  
5 = x;
```

(b) _____ (3)

```
int i = 2;  
int j = 4;  
int k = 6;  
if(i < j < k) {  
    System.out.println(i + " is smallest");  
}
```

(c) _____ (3)

```
public static String myMethod(int x) {  
    if( x > 5 ) {  
        return "bigger than five!";  
    }  
}
```

(d) _____ (3)

```
boolean do = true;
```

3. The following Java program compiles and runs. What is its output?

(10)

```
public class IfTest
{
    public static void main(String[] args)
    {
        int x = 14;
        int y = 21;
        int z = 2;
        if (x > 10) {
            System.out.println("A");
            if (y > 20) {
                System.out.println("B");
            } else if (z > 2) {
                System.out.println("C");
            } else {
                System.out.println("D");
            }
            System.out.println("E");
        } else if (x > 15) {
            System.out.println("F");
            if (y < 10) {
                System.out.println("G");
            } else if (z < 1) {
                System.out.println("H");
            } else {
                System.out.println("J");
            }
            System.out.println("K");
        } else if (z < 1) {
            System.out.println("L");
            if (y < 20) {
                System.out.println("M");
            } else if (x < 20) {
                System.out.println("N");
            } else {
                System.out.println("P");
            }
        }
        if (y > 10) {
            System.out.println("Q");
            if (x > 0) { System.out.println("R"); }
        } else if (z > 1) {
            System.out.println("S");
        } else if (y > 10) {
            System.out.println("T");
            if (x > 0) { System.out.println("W"); }
            System.out.println("X");
        }
    }
}
```

4. The following Java program compiles and runs. What is its output?

(10)

```
public class Fib {

    public static int fillFibArray(int[] fib) {
        fib[0] = 1;
        fib[1] = 1;
        for(int i = 2; i < fib.length; i++) {
            fib[i] = fib[i-1] + fib[i-2];
        }
        return fib.length;
    }

    public static void main(String[] args) {

        int n = 42;
        int[] arr = {2, 4, 6, 8, 10, 12, 14, 16, 18};

        n = fillFibArray(arr);
        System.out.println("n = " + n);

        for(int i = 0; i < arr.length; i++) {
            System.out.println("arr[" + i + "] = " + arr[i]);
        }
    }
}
```

5. The following Java program compiles and runs. What is its output?

(10)

```
public class LoopTest {  
  
    public static void main(String[] args) {  
        int n = 3;  
        for(int i = 0; i < 30; i += 5) {  
            System.out.println("i = " + i);  
            while(n < i) {  
                System.out.println("n = " + n);  
                n *= 2;  
            }  
        }  
    }  
}
```

6. Write a method that returns the number of times that the String "hi" appears anywhere in the given String. (10)

`countHi("abc hi ho") → 1`

`countHi("ABChi hi") → 2`

`countHi("hihi") → 2`

`countHi("hiHIhi") → 2`

`countHi("h") → 0`

`countHi("hello") → 0`

```
public static int countHi(String str) {
```