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Put your name on each page, or risk having an incompletely graded exam. Raise your hand to notify a proctor if you have a question. After being recognized by the proctor, walk to the front of the room to ask the instructor your question. **No talking, no tapping or other noise. No cell phones, pagers, or other electronics.**

Read the entire exam and answer the questions that seem easiest first. Write answers in the box when provided.

This page: grader use only.

Question 1: ☐

Question 2: ☐

Question 3: ☐

Question 4: ☐

Question 5: ☐

Question 6: ☐

Question 7: ☐

Question 8: ☐

Exam Total: ☐

In the exam that follows, do not write in the boxes labeled "Total score".

Page 1—Be sure to put your name on every page. The answers for all questions must be on the same page as the questions.

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total score

1) Write the STDOUT from the following code. If there is no output, write "NONE". If it is an infinite loop, write "∞". 5 points each, 10 points total.

Output (1a):

```
//////////Question 1a
int i = 0;
for(i = 5; i > -5; i=i-3){
     System.out.println("i: " + i);
}
```

```
//////////Question 1b
int i = 0;
for( ; i < 49; i+=7){
     System.out.print(i%6 + "\n" );
}
```

Output (1b):

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total score

2) Given the STDOUT provided below, construct a loop or nested loop that could have generated that output (ignore lines starting with "//"). Note that "…" found at the end indicates an infinite loop that repeats the entire output. Defining a class and a main method is not necessary; just a loop and necessary variables. 5 points each, 10 points total.

```
// Question 2a
[START]
[1]
[2]
[4]
[7]
[11]
[16]
[END]
```

Code (2a):

```
// Question 2b
1
2
22
4
44
444
8
88
888
8888
```

Code (2b):

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3) Write the STDOUT generated by the following code. If the compiler would generate an error, write "CE" to indicate a compiler error, or "RE" to indicate a runtime error. If the output is an infinite loop, write "∞". 5 points each.

```
//// Question 3a
public static void A(int a){
     a += 3*a
}

public static void B(int b){
     b -= b * (2 + 1);
}

public static void main( String args[] ){
     int input = 1;
     for( i = 0; i < 3; i++){
          A ( B( input ) );
          System.out.println( "input: " + input );
     }
}
```

Output (3a):

```
//// Question 3b
public static int A(int a){
     return a*a;
}

public static void main( String args[] ){
     int i = 0, val = 3;
     for(i = 0; i<5; i++){
          val = A(val);
     }

     System.out.println("val: " + val );
}
```

Output (3b):

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4) Given a main method that calls a method called "A()", and a the STDOUT that is generated by the main method, implement the method A(). 10 points.

```
public static void main( String args[] ){
      int i = 0;
      String word = "A";
      for(i = 0; i<4; i++){
            word = A( A(word) );
            System.out.println("v: " + word );
      }
}
```

Output (4):
```
v:   Aaa
v:     Aaaaa
v:       Aaaaaaa
v:         Aaaaaaaaa
```

public static String A(String a){

}

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total score

5) In the following code, indicate the type of the variable printed in the method called "A()". If the compiler would generate an error, write "CE" to indicate a compiler error. If an error would be generated at runtime, write "RE" to indicate a runtime error. 5 points each, 10 points total.

```
////  Question 5a
public static int B(double b){
     int c = 2*b
     return c;
}

public static void A( double a ){
     double b = B(a);
     System.out.println("i: " + (c + a) );
}
```

Output (5a):

```
////  Question 5b
public static double B( double b ){
     return b + 7.2;
}

public static int B( int b ){
     return b + 3.5;
}

public static int A( int a ){
     return B(a);
}
```

Output (5b):

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6) Convert all of the following loops into code using **for** loops that produce the same output. 5 points each, 10 points total.

```
// Question 6a
int x=10;
do {
     x += 5;
     System.out.println(x);
} while (x < 10);
```

Answer (6a):

```
// Question 6b
int i=0, j=40;
while (i < 40) {
     while (j > 0) {
          System.out.println(i*j);
          j -= 4;
     }
     i += 2;
}
```

Answer (6b):

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7) Write the STDOUT generated by the following code. If the compiler would generate an error, write "CE" to indicate a compiler error, or "RE" to indicate a runtime error. If the output is an infinite loop, write " ". 5 points each.

```
//// Question 7a
int count = 0;
do {
     System.out.println("Go Lehigh!");
     count++;
} while (count > 10);
```

Answer 7a:

```
//// Question 7b
int i = 0;
for (i = 0; i < 10; i++);
     System.out.println(i + 4);
```

Answer 7b:

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8) Write a method on the next page called m() to compute the following series:

$$m(i) = \frac{1}{3} + \frac{2}{5} + \frac{3}{7} + ... + \frac{i}{2i+1}$$

Write a test program below that displays the following table (20 pts):

```
   i   m(i)
   1   0.3333
   2   0.7333
       .
       .
       .
  19   8.7602
20     9.2480
```

public class Test {

}

Put your method m() here: