

This pledged exam is open text book but open-notes, closed-calculator, closed-neighbor, etc. Questions are worth different amounts, so be sure to look over all the questions and plan your time accordingly.

The following definition is to be considered in effect for all short answer questions. It is not to be assumed when you are asked to write a method or a program.

```
Scanner stdin = new Scanner( System.in );
```

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Total	_____ /100

1. (3 points) What is your section

_____ CS101X-1

_____ CS101X-2

DECISION BASICS

2. (16 points) Briefly indicate what the following code segments do. All answers must be 20 words or less. The first is done for you.

```
a. int n = stdin.nextInt();
   if ( ( n % 2 ) == 0 ) {
       System.out.println( n );
   }
```

Displays the input if it is an even number.

```
b. int n = stdin.nextInt();
   if ( n < 0 ) {
       n = -n;
   }
   System.out.println( n );
```

Displays the

```
c. int a = stdin.nextInt();
   int b = stdin.nextInt();
   int c = stdin.nextInt();
   if ( ( b <= a ) && ( a <= c ) ) {
       System.out.println( a );
   }
   else if ( ( a <= b ) && ( b <= c ) ) {
       System.out.println( b );
   }
   else {
       System.out.println( c );
   }
```

Displays the

```
d. String s = stdin.next();
   if ( s.equals( "aardvark" ) ) {
       System.out.println( true );
   }
   else {
       System.out.println( false );
   }
```

Displays

LOOP BASICS

3. (16 Points) Briefly indicate what the following code segments do. All answers must be 20 words or less. The first is done for you.

```
a. while ( stdin.hasNext() ) {
    int a = stdin.nextInt();
    int b = stdin.nextInt();
    int sum = a + b;
    System.out.println( sum );
}
```

Displays the sum of pairs of numbers from standard input.

```
b. int n = 0;
   while ( stdin.hasNext() ) {
       int x = stdin.nextInt();
       n = n + 1;
   }
   System.out.println( n );
```

Displays the

```
c. int s = 0;
   int n = 0;
   while ( stdin.hasNext() ) {
       int x = stdin.nextInt();
       s = s + x;
       n = n + 1;
   }
   int a = s / n;
   System.out.println( a );
```

Displays the

```
d. int n = 0;
   while ( stdin.hasNext() ) {
       String s = stdin.next();
       if ( s.indexOf( "a" ) == 0 ) {
           n = n + 1;
       }
   }
   System.out.println ( n );
```

Displays the

METHOD BASICS

4. (16 points) Briefly indicate what the following methods do. All answers must be 20 words or less. The first is done for you.

a.

```
public static void g(int n) {
    int a = 0;
    while ( a < n ) {
        System.out.println( "" );
        a = a + 1;
    }
}
```

Prints n blank lines

b.

```
public static int g(int n) {
    return n * n;
}
```

Returns

c.

```
public static boolean g(int m, int n) {
    if ( m < n ) {
        return true;
    }
    else {
        return false;
    }
}
```

Returns

d.

```
public static int g(int a, int b, int c) {
    if ( ( b <= a ) && ( a <= c ) ) {
        return a;
    }
    else if ( ( a <= b ) && ( b <= c ) ) {
        return b;
    }
    else {
        return( c );
    }
}
```

Returns

PARAMETER PASSING

5. (12 Points) Suppose method `main()` has the following definition.

```
public static void main( String[] args ) {
    int n1 = 1;
    int n2 = 2;
    int n3 = 3 ;
    Point p1 = new Point( 1, 1 );
    Point p2 = new Point( 2, 2 );
    Point p3 = new Point( 3, 3 )
    f( n1 );
    n2 = g( n3 );
    h( p1 );
    k( p2, p3 );
}
```

a. What is the value of `n1` when method `main()` completes if `f()` has definition:

```
public static void f ( int a )
    a = 0;
}
```

<code>n1 = _____</code>

b. What is the value of `n2` when method `main()` completes if `g()` definition:

```
public static int g( int a )
    return a;
}
```

<code>n2 = _____</code>

c. What is the value of `p1` when method `main()` completes if `h()` has definition:

```
public static void h ( Point a )
    a.setLocation( 0, 0 );
}
```

<code>p1 = (_____, _____)</code>

d. What is the value of `p2` when method `main()` completes if `k()` has definition:

```
public static void k( Point a, Point b ) {
    b = a;
}
```

<code>p2 = (_____, _____)</code>

SCOPE

6. (4 points) What is wrong with the following code segment?

```

System.out.print( "Enter integers: " );
while ( stdin.hasNext() ) {
    int number = stdin.nextInt();
}
System.out.println( "Last input was "
    + number );

```

LOOPING

7. (4 points) What is the output of the following code segment?

```

int counter1 = 0;
int counter2 = 0;
int i = 1;
while ( i <= 3 ) {
    counter1 = counter1 + 1;
    int j = 1;
    while ( j <= 10 ) {
        counter2 = counter2 + 1;
        j = j + 1;
    }
    i = i + 1;
}
System.out.println( "counter1 = " + counter1 );
System.out.println( "counter2 = " + counter2 );

```

```

counter1 = _____
counter2 = _____

```

OBJECTS

8. (4 points) Suppose the following definitions are in effect.

```

String s1 = "cs101x";
String s2 = "cs101x";
String s3 = new String( "cs101x" );
String s4 = new String( "cs101x" );

```

What are the values of the following **boolean** expressions?

- _____ s1 == s2
- _____ s1 == s3
- _____ s3 == s4
- _____ s3.equals(s4)

PROBLEM SOLVING

9. (10 points) Write a service method **isEven()** using the following specification:

- Formal parameter list: **int** *n*
- Return type: **boolean**
- Service: returns whether *n* is an even number.

PROBLEM SOLVING

10. (15 points) Write a complete program **Multiplier** that reads all of the values from standard input until there are no more (you can assume they are integers). The program prints the product of the numbers. Your solution need not comment, prompt, or print the input values (echoing).