

Show all of your work clearly in the space provided or on the additional page at the end of the exam. **read each problem carefully**. Note that the exam is double sided.

1. (10 points) What happens when you compile a Java program?

2. (10 points) Write the following mathematical expression as a legal Java expression (assume that x, y, and z are `doubles`):

$$z = \frac{1}{2} + \frac{1}{xy}$$

3. (10 points) List the primitive Java types for the following categories:

1. Integer numbers
2. Floating point (decimal) values

4. (15 points) Consider the following code fragment. Without changing the loop type, modify the code to incorporate an `if` statement within the loop body that prevents anything being displayed whenever the value entered is zero.

```
Scanner in = new Scanner(System.in);
int i;
do {

    i = in.nextInt();

    System.out.println("square = " + (i * i));

} while( x!=0 );
```

5. (10 points) Assume the following declarations:

```
int i;
double d;
float f;
long l;
```

Identify which, if any, of the following statements would compile without error. Rewrite any remaining statements so that they no longer cause a compiler error.

1. `i = d;`
2. `l = f;`
3. `l = i;`
4. `d = i;`
5. `d = f;`

6. The following code segment is supposed to print the sum of the numbers 1 through 3 and the product of the numbers 1 through 3. The code currently contains at least one error.

```
1  int count = 0;
2  int sum = 0;
3  int product = 0;
4  while(count <=3) {
5      count++;
6      sum += count;
7      product *= count;
8      if(count==3) {
9          System.out.println("Sum_=_ " + sum);
10         System.out.println("Product_=_ " + product);
11     }
12 }
```

(a) (15 points) Trace the program (as written) using the long form tracing technique.

| line# | count | sum | product | output |
|-------|-------|-----|---------|--------|
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(b) (10 points) Suggest how the program could be fixed so that it would operate as intended.

6. (20 points) Complete the following program by inserting the appropriate code in the space provided on the next page. The program must ask the user to enter `desiredNumber` integer values, where `desiredNumber` is entered by the user (see bottom of this page). For each number entered, the program must indicate if the number is evenly divisible by three.

Sample program run:

```
How many numbers would you like to evaluate? 2
Enter an integer: 8
8 is not divisible by 3
Enter an integer: 99
99 is divisible by 3
```

```
public class Exam {
    public static void main(String [] args)
    {
        System.out.println("How many numbers would you like to evaluate?");
        Scanner in = new Scanner(System.in);
        int desiredNumber = in.nextInt();
    }
}
```



// Add your code here.

}
}



Additional space — indentify which problem your work is associated with.