**CSC 20 – Module 1 Problems**

The following are possible small written problems that you might see on an exam.

**Scanner Problems**

1) Simulate the following code snippet and cross out any lines that cause an exception.

Scanner in = new Scanner("hello 1 2\ngoodbye 1 2\nwhoop!");

int a = in.nextInt();

String b = in.next();

double c = in.nextDouble();

String d = in.nextLine();

String e = in.nextLine();

After executing the lines that you did not cross out, what are the values of each of the variables? What is left in the input buffer? (Include a decimal point in any double and quotes around any String.)

2) Do the same exercise as Problem 1 on the following code snippet.

Scanner in = new Scanner("hello 1 2\ngoodbye 1 2");

String a = in.next();

String b = in.next();

String c = in.next();

double d = in.nextDouble();

String e = in.nextLine();

String f = in.nextLine();

**Random Problems**

1) Write three lines of code, one that creates a Random object, a second that assigns a random 3-digit integer (ie, 100..999) to int x, and a third that assigns a random double in the range 100..999 to double y.

**Exception Problems**

1) Write a method "isPrime" that takes an integer as a parameter and returns boolean true if and only if the integer is prime. An integer x is prime if x>1 and the only factors for x are 1 and x. If the parameter is negative throw an IllegalArgumentException. Embed your method in a small test program and test that it works.

2) Write a method "newFileScanner" that takes a file name as a String and attempts to return a Scanner connected to a file by that name. If the file does not exist, return null. Structure your method with a try/catch block. Inside the try block you should: new Scanner(new File(fileName)). If the file does not exist, this action will throw a FileNotFoundException. In your method, have a catch block catch such an exception and use the catch block to make the return value null. Embed your method in a small test program and test that it works.

**Formatting Problem**

1) Below is a poorly formatted program that asks for two numbers and prints the length of the hypotenuse of a triangle with sides of the specified lengths. The variables are named poorly too. Rewrite using good formatting and naming practice.

import java.util.Scanner; public class a { public static double b(double c, double d) { return Math.sqrt(c\*c + d\*d); } public static double e(Scanner f, int g) { double h = -1.0; while (h <= 0) { System.out.print("Side " + g + ": "); if (f.hasNextDouble()) { h =