**44-542 Object Oriented Programming Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Exam 01 (100 points) KEY** *please print*

1. (6 pts) Assume we have declared and instantiated the following references to **String** objects:

**String str1 = "go bearcats";**

**String str2 = "lazy lizards";**

**String str3 = "winter is coming";**

Evalute the following expressions:

* 1. **str2.substring(5) + str3.substring(0,3)** = \_\_\_\_\_**lizardswin**\_\_\_\_
  2. **str2.indexOf("a")** = \_\_\_**1**\_\_\_

1. (6 pts) Assume we have declared and instantiated the following **int** variables.

**int num1 = 5;**

**int num2 = 22;**

**int num3 = 3;**

Evalute the following expressions:

* 1. **num1 + num2 / num3 \* num1 - num2 - num3** = \_\_\_\_\_**15**\_\_\_\_
  2. **num1 + num2 < num3 \* num1 && num2 - num3 > 0 || num2 < num3** = \_\_**false**\_\_

1. (10 pts) Find the output of the following code segment:

**OUTPUT**

**5 22 3**

**4 21 6**

**3 20 9**

**2 19 12**

**2 18 16**

**2 17 20**

**int num1 = 5;**

**int num2 = 22;**

**int num3 = 3;**

**while(num3 < num2)**

**{**

**System.out.println(**

**num1 + " " + num2 + " " + num3);**

**if(num1 + num2 > 22)**

**{**

**num3--;**

**num1--;**

**}**

**num3 += 4;**

**num2--;**

**}**

**System.out.println(**

**num1 + " " + num2 + " " + num3);**

1. (9 pts) Consider the following code segment:

**if (num1 + num2 < 50)**

**{**

**num3 \*= 2;**

**} else if (num2 > num1)**

**{**

**num3 -= 10;**

**} else**

**{**

**num3++;**

**}**

**if (num2 > 25)**

**{**

**num3 += 20;**

**}**

**System.out.println(num3);**

Find the output of this code segment assuming **num1**, **num2**, and **num3** are initialized as shown below:

**int num1 = 4; int num2 = 26; int num3 = 3;**

**OUTPUT**

**26**

**int num1 = 4; int num2 = 48; int num3 = 3;**

**OUTPUT**

**13**

**int num1 = 40; int num2 = 24; int num3 = 3;**

**OUTPUT**

**4**

1. (5 pts) Write a single statement to create an array of **int** values named **nums**, that will hold up to 10 values.

**int[] nums = new int[10];**

1. (10 pts) Write the code for the method described here.

**/\*\***

**\* Returns the sum of the numbers in the array myNumbers, passed**

**\* as a parameter. The array myNumbers should not be altered by**

**\* this method.**

**\* @param myNumbers The list of numbers to be summed.**

**\* @return the sum of the numbers in myNumbers.**

**\*/**

**public static int findSum(int[] myNumbers)**

**{**

**int sum = 0;**

**for (int num : myNumbers)**

**{**

**sum += num;**

**}**

**return sum;**

**}**

1. (6 pts) Write the prototype for the above method.

**public static int findSum(int[] myNumbers) or**

**public static int findSum(int[])**

**Fill in the blanks (6 points – 2 points for each blank).**

1. The java command invokes the \_Java Virtual Machine or JVM\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to translate the Java bytecode into machine code and run the program.
2. Examples of two integer types in Java are \_\_\_\_ and \_\_\_\_ (byte, short, int, long).

**Multiple choice (2 points each – 42 points total).**  Write the letter corresponding to the BEST correct answer.

***Select only ONE answer for each question. If you select more than one answer, the entire question will be counted as wrong.***

1. Which of the following is/are true of primitive types?
   1. int is an example of a primitive type
   2. primitive types are considered objects
   3. primitive types can have methods
   4. all of the above are true
   5. only b) and c) are true
2. Character literals are delimited by
   1. double quote marks (“”)
   2. single quote marks (‘’)
   3. percent signs (%%)
   4. a single backslash (\)
3. Which of the following precedence rules is/are true?
   1. Multiplication (\*) takes precedence over division (/)
   2. Division (/) takes precedence over subtraction (-)
   3. Logical operators (not, and, or) take precedence over relational operators (<, >, ==, etc)
   4. All of the above are true
   5. Only a) and c) are true
4. The behavior of an object is defined using
   1. attributes
   2. methods
   3. constructors
5. In Java, constants are declared with the keyword
   1. const
   2. constant
   3. final
   4. static
6. To read from the console in Java, use the \_\_\_\_ object
   1. stdin
   2. In
   3. System.in
   4. System.out
7. In a Java program the statement

Math.sqrt(2) \* Math.sqrt(2) == 2

returns

* 1. true
  2. false

1. Consider the following code segment:

String str1 = “Hello”;

String str2 = str1;

String str3 = new String (“Hello”);

String str4 = str3;

How many copies of “Hello” are stored internally?

* 1. 1
  2. 2
  3. 3
  4. 4

1. Output can be directed to a file using the \_\_\_\_\_ class.
   1. Output
   2. Printer
   3. PrintWriter
   4. System
2. Which of the following is/are true of arrays in Java?
   1. an array is an object
   2. the Array class enables you to construct an array
   3. arrays have a method named length(), which returns the number of elements currently stored in the array
   4. all of the above are true
   5. only a) and c) are true
3. When defining a Java class, the filename must be the same as the name of the class, including having the same capitalization; extension should be .java.
   1. true
   2. false
4. Which of the following is/are true of Java bytecode?
   1. the Java bytecode generated is dependent on the hardware being used – that is, different bytecode is generated for different hardware platforms
   2. the JVM translates the bytecode into machine language executed by the hardware
   3. Java bytecode is code for an abstract machine
   4. both b) and c) are true
5. To compile a Java program at the command prompt, use the command
   1. java
   2. Java
   3. javac
   4. Javac
6. If the file MyProgram.java is successfully compiled, the compiled code is in a file named
   1. MyProgram.java
   2. MyProgram.javac
   3. MyProgram.class
   4. MyProgram.bytecode
7. Which of the following is/are true of syntax errors?
   1. a missing semicolon is an example of a syntax error
   2. syntax errors are detected at run time
   3. a .class file is not generated if syntax errors are present
   4. all of the above are true
   5. only a) and c) are true
8. The state of an object is stored using
   1. attributes
   2. methods
   3. constructors
9. When defining a class, most attributes are specified as
   1. public
   2. private
10. System.out is an object of the \_\_\_\_\_\_\_ class
    1. Writer
    2. PrintStream
    3. Print
    4. Printer
11. A mutator method does not change the object.
    1. true
    2. false
12. Which of the following is/are true of constructors?
    1. constructing a specified object is called instantiation
    2. frequently the constructor is used to initialize the instance variables
    3. a class may have more than one constructor
    4. all of the above are true
    5. only b) and c) are true
13. A constructor with no parameters is called a(n) \_\_\_\_\_\_ constructor
    1. no-arg
    2. parameterless
    3. empty
    4. default