# ICS 111 Spring 2016 Midterm Exam, March 3, 2016

Clearly write you name on the **front** and **back** of this exam.

This exam is closed-book. No calculators or computers are allowed. There are a total of 100 points. Be sure to answer all parts of each question.

**Question 1** (5 points): Explain the difference between *high-level* languages and *machine* languages

**Question 2** (5 points): What is the difference between a *compiler* and an *interpreter*?

**Question 3** (5 points): Briefly explain what is meant by the *syntax* and the *semantics* of a programming language.

**Question 4** (5 points): One of the primitive types in Java is *boolean*. What is the *boolean* type? Where are *boolean* values used? What are its possible values?

**Question 5** (5 points): What is an *algorithm*?

**Question 6** (5 points): What is the main difference between a *while* and a *do..while* loop?

**Question 7** (15 points): Write a program that asks the user to enter an integer, reads the user’s response, and tells the user whether the number entered is even or odd. You may use TextIO.getlnInt() to read the integer. (Recall that an integer n is even if n % 2 == 0.)

**Question 8** (5 points): Write a *for* loop that prints out all the multiples of 7 from 0 to 77.

**Question 9** (15 points): Use the following code to answer the three questions.

int x;

if (x <= 25) { System.out.println(“foo”); }

else if (x > 25) { System.out.println(“bar”); }

if (!(x == 25)) { System.out.println(“baz”); }

What will be the output if **x** is equal to 25?

What will be the output if **x** is equal to 26?

What will be the output if **x** is equal to 24?

**Question 10** (15 points): Write a subroutine *max* with two parameters of type *int*. The subroutine should return the bigger of the two parameters.

**Question 11** (20 points, 2 points per expression): Evaluate the following expressions. Write the value of *answer* next to the expression.

**int answer = (2 \* (60 – 50)) / (5 + 5) \* 2;**

**int answer = 2 \* 60 – 50 / 5 + 5;**

**int answer = 60 – 50 / (5 + 5);**

**double answer = 20 – 5 \* 2 % 3;**

**int answer = 60 – 50 / 5 +5 ;**

**int answer = 60 – 50 / 5 + 5 \* 2**

**int answer = 30 + 20 / 5 \* 2 – 2**

**double answer = (30 + (20 / 5)) \* 2 - 2;**

**int answer = ((30 + 20) / 5) % (2 + 1);**

**int answer = 30 + (20 / 5 \* 2 - 2);**