This exam is open text book but closed-notes, closed-calculator, closed-neighbor, etc. Questions are worth different amounts (in particular, the final question is worth substantially more than any other question), so be sure to look over all the questions and plan your time accordingly. Please sign the honor pledge here:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

1. (2 points) What section are you in?
   
   ___ CS 101-E
   ___ CS 101-2 (lab 7-8:30 PM Thu)
   ___ CS 101-3 (lab 12-1:30 PM Fri)
   ___ CS 101-4 (lab 2-3:30 PM Fri)

2. (2 points) What is your overall impression of the class so far? Check only one in each column.
   
   ___ Too slow
   ___ Too fast
   ___ Just right
   ___ Too easy
   ___ Too hard
   ___ Just right

   ___ / 4

Note: When an integer type is required use int, when a floating-point type is required use double.
3. (3 points) What is the value of the following expression?
   \[(0.75 \times 4.0)\]

4. (3 points) What is the value of the following expression?
   \[((3/4) \times 4)\]

5. (3 points) What is the value of the following expression?
   \[(25 \mod 5 - 2)\]

6. (3 points) What is the value of the following expression?
   \[(12 / (1+5))\]

7. (3 points) What is the value of the following expression?
   \[(12 / (5 + 1.0))\]

8. (3 points) What is the value of the following expression?
   \[(12 / (5.0 + 1))\]

9. (4 points) When a Java application program is run, execution always begins by calling a certain method. Show exactly how you declare this method.

10. (3 points) Give a Java statement to define and initialize a floating-point constant to represent the number of radians per degree (which is π/180.0). You may approximate this value in your code as 0.0175.
11. (3 points) Give a Java statement to define and initialize an integer variable to represent how many pigeons fit in a pigeonhole (you pick the value).

12. (3 points) Does the following code snippet compile without error? If not, explain the error that prevents the code from compiling. If the code does successfully compile, give the value of all variables after the code snippet executes:

```java
int i = 3;
int n = 4;
i = n;
n = i;
```

13. (3 points) Does the following code snippet compile without error? If not, explain the error that prevents the code from compiling. If the code does successfully compile, give the value of all variables after the code snippet executes:

```java
int i = 3;
int n = 4;
i = 2 * i * n;
```

14. (3 points) Does the following code snippet compile without error? If not, explain the error that prevents the code from compiling. If the code does successfully compile, give the value of all variables after the code snippet executes:

```java
double pi = 3.14;
int n = 2;
n = n * pi;
```
15. (3 points) Does the following Java code snippet compile without error? If not, explain the error that prevents the code from compiling. If the code does successfully compile, give the value of all variables after the code snippet executes:

```java
double pi = 3.14;
double radius;
double circumference = 2.0 * pi * radius;
```

16. (3 points) Write a single statement that declares and initializes a `Scanner` object that will read user input from the keyboard.

17. (4 points) Write a code snippet that prompts the user to enter the number of blackbirds per pie, and uses the `Scanner` object declared above to read it into an integer variable.

18. (3 points) Write a Java comment stating that most pies contain 24 blackbirds.
19. (6 points) Explain BRIEFLY (30 words or less total) what the difference is between:

\[
\text{String } s; \\
\text{and} \\
\text{String } t = \text{null;} \\
\text{and} \\
\text{String } u = "";
\]

20. (10 points) Consider the following code segment:

\[
\text{String quote }= \text{"the quick brown fox";} \\
\text{System.out.println("length = " } + \text{quote.length());} \\
\text{System.out.println("indexOf('q') = " } + \text{quote.indexOf('q'));} \\
\text{System.out.println("indexOf('z') = " } + \text{quote.indexOf('z'));} \\
\text{System.out.println("substring(0,2) = " } + \text{quote.substring(0,2));} \\
\text{System.out.println("substring(4) = " } + \text{quote.substring(4));} \\
\text{System.out.println("charAt(8) = " } + \text{quote.charAt(8));}
\]

What is the output?
21. (10 points) Using the memory depiction techniques that we have used in the book and in lecture, draw what memory looks like after the following Java code completes.

```java
String s = "foo";
String t = s;
Rectangle r = new Rectangle (1,2,3,4);
Rectangle s = new Rectangle (1,2,3,4);
int x = 5;
int y;
```
22. (20 points) Write an entire, complete Java program that prompts the user to input their first, last, and middle names (separately and in that order), then prints out their name in the following form: "Luebke, David P." Note that you should abbreviate their middle name (including the period). This program will have to be in a class named NameGames. For brevity you may omit the "good programming practices": comments, printing a legend, echoing input, etc. You may use the back of this page if you need more space.

Your program should go through the following steps:
1) Create a Scanner object
2) Prompt for and obtain the three names
3) Find the middle initial from the middle name (hint: you can use substring())
4) Create the final form of the name (i.e. "Luebke, David P.")
5) Print the output