This exam totals to 100 points. Follow the instructions. Good luck!

Chapter 2
This chapter was solely on variables. You may expect a short answer or a programming question.

Short Answer Questions – These questions are more conceptual and could be true-or-false questions with a short explanation, or write what the program snippet will print out. Also you can expect a question on the mod (%) operator.

1. Will this programming snippet give an error? True or False? If this does cause an error then why?
   
   ```java
   String value1 = "34.0";
   int value2 = value1;
   ```
   
   Answer: True, it will cause an error because you cannot assign a String class type to an integer primitive type.

2. What will this program print out?
   
   ```java
   int number = 20%7;
   System.out.println(number);
   ```
   
   Answer: 6, 20/7 is 2 with a remainder of 6. Remember mod gives the remainder.

Programming Questions – These questions will be very similar to the lab assignments or the homework.

1. Write a program that prompts the user for a number which corresponds to degrees and change that number into radians. Then prints both the input and result. This conversion is rad = deg x 3.14159/180.0. Also assume that the input and the result are both double.

   ```java
   import java.util.Scanner;
   public static void main(String[] args)
   {
       Scanner keyboard = new Scanner(System.in);
       //Put your code here

       System.out.println("Enter some degrees");
       double input = keyboard.nextDouble(); //get the input
       double result = input*3.14159/180.0; //calculate the result
   }
   ```
Chapter 3
This chapter dealt with branch statements: if, else-if, else, and switch statements. There may be a question about converting a switch statement to the equivalent if, else-if, else.

Short Answer Questions
1. When this program is executed, what will it print out?

```java
int number = 10;
if(number < 5)
{
    System.out.println("A");
}
else if(number < 100 && number > 5)
{
    System.out.println("B");
}
else if (number < 20)
{
    System.out.println("C");
}
else
{
    System.out.println("D");
}
if(number > 1 || number <=5)
{
    System.out.println("E");
}
else if(number > 2 && number <=40)
{
    System.out.println("F");
}
else
{
    System.out.println("G");
}
```

Answer:
B
E
2. Convert this if, else if, else into a switch statement

```java
if(n == 0)
{
    System.out.println("0");
}
else if(n == 1)
{
    System.out.println("1");
}
else
{
    System.out.println("?" rum
}
```

Answer:
```
switch(n)
{
    case 0:
        System.out.println("0");
        break;
    case 1:
        System.out.println("1");
        break;
    default:
        System.out.println("?");
}
```

Programming Questions
Expect something similar to labs or homework assignments.

1. Write a program where the user enters an integer and the program checks whether or not it is between 0 and 255 (both inclusive so it can be 0 and 255). If it is then the number is valid and the program will say that the number entered is valid. Otherwise it will prompt the user that they have entered an invalid number.

```java
import java.util.Scanner;
public static void main(String[] args)
{
    Scanner keyboard = new Scanner(System.in);
    //Put your code here
```
System.out.println("Enter a number between 0 and 255 inclusively");
    int number = keyboard.nextInt(); //get the input
    if(number>=0 & number<= 255) //this is valid
    {
        System.out.println("This is a valid number!");
    }
    else //this is not valid
    {
        System.out.println("The input is invalid");
    }
}

Chapter 4
This chapter dealt with loops: while, for, and do-while. This will mostly be short answer and programming.

Short Answer
Be able to explain the difference between “do-while” and “while”. Also be able to convert a “for” into a “while” and vice versa. Finally, be able to figure out what a loop prints out.

1. Explain the difference between a while and a do-while loop?
   The body of a do while will run at least once, and a while’s body may never run at all.
2. Convert this for statement into a while statement

   for(int i=0;i<20;i++)
   {
       System.out.print(i + " ");
   }

   Answer:
   int i=0;
   while(i<20)
   {
       System.out.println(i + " ");
       i++;
   }

3. What does the following program display?

   for(int i=0;i<10;i++)
Programming Questions
Similar to the labs and examples. Also expect a question either on this exam or the final that has you print out something like the triangle from the lab assignment.

1. Write a program where the user enters a number, and the program prints out right triangle where the number is the width of the base. The triangle’s base must be a the top and then go to the points.
   Example: If the user enters 5 the program will print out
   *****
   ****
   ***
   **
   *
   import java.util.Scanner;
   public static void main(String[] args)
   {
   Scanner keyboard = new Scanner(System.in);
   //Put your code here
   System.out.println("Enter the size of the triangle");
   int number = keyboard.nextInt(); //get the base size
   for(int i=number;i>0;i--) //this one counts backwards
   {
   //each i corresponds to the number of * to be printed
   for(int j=i;j>0;j--)
   {
   System.out.print("*");
   }
   System.out.println();//next line
   }
   }

2. Write a program where the user enters a number, and then the program adds 10 from that number until the number is greater than 50. It must print out the new value at each step.
   Example if the user enters 14 the program will print out
   14
import java.util.Scanner;

public static void main(String[] args)
{
    Scanner keyboard = new Scanner(System.in);
    System.out.println("Enter a number");
    int number = keyboard.nextInt(); //get the initial number

    while(number <= 50) //until that number is greater than 50
    {
        System.out.println(number);
        number+= 10; //keep adding 10
    }
}

Chapter 7
This chapter was on arrays, and will be mostly short answer and program questions.
No sorting algorithms will be on this exam.
1. Write a program that finds the minimum and maximum number from an array and then subtracts the maximum from the minimum and prints the result out. The first line printed must be in the format, MAXIMUM-MINIMUM=RESULT
Example if the array given was {10,4,6,8,2} the program would print out 10-2=8

public static void main(String[] args)
{
    Scanner keyboard = new Scanner(System.in);
    int[] a = {10, 4, 6, 8, 2};
    int min = a[0];
    int max = a[0];
    for(int i=1;i<a.length;i++)
    {
        if(a[i]<min) //if the current index is less than the min
        {
            min = a[i]; //reset the min to the current index
        }
        if(a[i]>max) //if the current index is greater than the max
        {
2. Write a program that multiplies all the number in an array and then prints out the result.
   Example if the array given is {2,4,6,8} the program would print 384
   ```java
   public static void main(String[] args) {
       Scanner keyboard = new Scanner(System.in);
       int[] a = {2,4,6,8};
       int result = a[0];  //keeps track of the results
       for(int i=1;i<a.length;i++)
           result *= a[i];  //adds the current index to the result
       System.out.println(result);  //prints the result
   }
   ```

3. Write a program that goes through an array and then changes every instance of an even number into a 0, and then prints out the resulting array.
   Example if the array given is {1,2,3,4,5,6,7,8} the program will print out 1 0 3 0 2 0 7 0
   ```java
   public static void main(String[] args) {
       Scanner keyboard = new Scanner(System.in);
       int[] a = {1,2,3,4,5,6,7,8};
       //Looks for the even numbers in a loop
       for(int i=0;i<a.length;i++)
           //it is even if it is divisible by 2 and the remainder is 0
           if(a[i]%2 == 0) {
               a[i] = 0;
           }
       System.out.println(Arrays.toString(a));  //prints the resulting array
   }
   ```
4. Will this program cause an error? If so why does it cause an error? If not show what the program prints out?

```java
int[] a = {1, 2, 3, 4, 5};
for (int i = 0; i <= 5; i++)
{
    System.out.println(a[i] + " ");
}
```

Answer: This program will cause an error. When it reaches index 5 or a[5] this will go out of the boundary of the array, and cause an out of bound exception.