

**CS 313**

**Exam 2**  
**10 am**

**Name:** \_\_\_\_\_

**SSN:** \_\_\_\_\_

question	points	points possible
1		5
2		5
3		8
4		8
5		8
6		8
7		8
8		8
9		12
10		12
11		8
12		10

## Definitions. 5 pts each.

1. Exception.

2. Specialization.

## Short Answer. 8 pts each.

3. a) Given an integer variable `num` that has been initialized, write Java code that sets another integer variable `i` to be 0 if the 2nd bit from the right in `num`'s binary representation is 0, and 1 if the 2nd bit from the right in the binary representation of `num` is 1. Fill in the blank below with your code:

```
int num;  
// num is initialized  
...  
int i = _____ ;
```

b) For the specific value `num = 26`, show that your code above produces the 3rd bit from the right.

4. Complete the following line of Java code so that the following code reads a line of text from the file "test.txt":

```
_____ in = _____ ;  
in. readLine();
```

5. Given the following code:

```
int[] arrayOfInts = new int[100];  
//Assume the entries of arrayOfInts have been initialized.
```

Fill in the 2 lines of code below so that the integer variable *i* holds the index of 55 in *arrayOfInts* if 55 is an element in *arrayOfInts*.

```
_____ ;
```

```
int i = _____ ;
```

6. Given the following code:

```
int [] arr1 = new int[50];  
//Assume that the entries of arr1 have been initialized.  
int [] arr2 = new int[50];
```

Describe the differences between the following lines of code, if any. Do (i) and (ii) have the same result and effect? Explain your answer.

- (i) `System.arraycopy(arr2, 0, arr1, 0, 50);`
- (ii) `arr1 = arr2;`

7. In each part indicate the result of executing the code (and the new values of any variables):

a) `double x = 9.5;`  
    `int y = x;`

b) `double y = Math.pow(2, 3);`

8. When writing a method, under what circumstances would you be justified in throwing an exception and not catching it? How should you indicate that your method does not catch the exception? Explain your answer clearly.

## **Programming. 12 pts each.**

9. Write a program that takes 2 strings on the command line and prints a message to file "result.txt" indicating whether or not either is a prefix of the other. If there are not 2 strings on the command line, your program should print a message to the screen indicating that your program takes 2 command line arguments (and nothing should be printed to the file "result.txt").

10. Write a static method called swap that takes an array of integers as its argument and swaps the elements in the first and last positions in the array.

## Class Diagramming.

The next 2 questions refer to the following requirements specification for a simple card game.

The game is played between two players using a pack of 52 cards. Only the face values of the cards are used; their suits play no role in the game. There are 4 cards of each value and the values are from 1 to 13. A dealer divides the cards from the pack equally between the two players who keep their cards in the order they receive them. Once the cards have all been distributed, the players take it in turns to pass a single card to the dealer who places it onto the top of a pile of cards. They must play their cards in the order that they received them. If a player plays a card with the same value as that currently on the top of the pile, that player receives all the cards in the pile from the dealer. The winning player adds them to the end of any cards still held. Play continues with the player who took the pile passing the first card for a new pile to the dealer. The game ends when a player has no cards to play on their turn. The winner is the player with cards remaining, or the game is drawn if both have no cards.

11. Underline **all** noun phrases in the requirements specification above as the first step in using lexical analysis to determine the classes for the system.

12. From your list of potential classes (minus repetitions of the exact same noun phrase) in the above question, pick two that should be eliminated. Indicate for each which elimination criterion you use to eliminate the class, and justify your decision. You should use different elimination criteria in a) and b).

a) Noun phrase/potential class to be eliminated: \_\_\_\_\_

Elimination criterion used: \_\_\_\_\_

Explanation:

b) Noun phrase/potential class to be eliminated: \_\_\_\_\_

Elimination criterion used: \_\_\_\_\_

Explanation: