1. In class, we learned about two different types of exceptions. What are they called and how do they differ? Give an example of one situation where each exception might be thrown.

2. Write a short java class that contains, at minimum, two instance variables of different types, one constructor, one getter, one setter, and a toString method. Make sure you use proper naming conventions and indent appropriately.
3. Select the correct answer for the question “Composition is best described as when __________?” Then, give an explanation for what you picked:

A: An object *is an* extension of another object  
B: An object *implements* an interface  
C: An object *has* another object as part of its state  
D: An object inherits from another object

4. True or false: You can directly instantiate an abstract class

5. Let’s say we want to inherit from two classes, the Student class and the Employee class. As you know, Java does not allow multiple inheritance. Discuss some ways around not being able to inherit from multiple classes.

6. Create a new PrintWriter object from a BufferedWriter object that will write to a file named “PracticeTestsAreFun.txt”
7. The code below has a few errors and warnings that arise when I try to compile it. What can I change to fix the code so it runs with no compiler errors or warnings?

```java
import java.io.BufferedReader;
import java.io.FileReader;

public class TestHelper {
    public static void main(String[] args) {
        // Creates a new BufferedReader and FileReader to get the answers
        BufferedReader myReader = new BufferedReader(new FileReader("Test1_Answers.txt"));
        int input;
        while((input = myReader.read()) != -1) { // Reads in one byte at a time and sets it equal to input
          System.out.print((char)input); // Then checks to see if it's reached -1 (the end of file)
        }
    }
}
```

8. We know about the method substring in the Java String class. We can call this method in two ways with either 1 int argument or 2 int arguments. This is an example of what?
A. Overriding
B. Overloading
C. Adapting
D. Composition

9. Below you are given addition and subtraction in decimal number. Write the answer in binary and in decimal. Please use an 8-bit value number for your answer
a. 127 - 80
b. 127 - (-127)
c. -80 - 5
d. -31 - 100
e. 100 + 32
f. 54 + 12
10. What is the difference between an ArrayList and an array?

11. Is ArrayList a...?
   a. Generic Class
   b. Abstract Class
   c. Interface
   d. Abstract Data Type

12. Define ADT (Abstract Data Types) and list one example of an ADT.

13. Give the definition of the following:
   a. Class Composition:
b. Class Adaptation:

c. Class Inheritance:

d. An Interface:

14. Create an example interface that could be used for some methods in Super Mario World! (or any another game you know) Your interface should have at least three methods: One that returns a int, one that returns a boolean, and one that returns an array or list.

15. What is stored in result?
   Stack stck = new Stack()
   stck.push('a');
   stck.push('b');
   stck.push('c');
   stck.pop();
   Char result = stck.pop()

Note: stacks may or may not be on the test, depending on how much time each class has to talk about stacks before the exam, but that doesn’t mean you can’t study up on them anyway!
16. How are the end of lines noted in UNIX text files? DOS text files?

17. Why would you want to encapsulate a class?

18. Given the following code and text file “example.txt”, write the correct output:
   ```java
   example.txt:
   Hello
   World!
   Sup
   BufferedReader br = null;
   try
   {
       br = new BufferedReader(new FileReader("example.txt"));
   }
   catch (FileNotFoundException e)
   {
       System.out.println("ERROR: File example.txt not found.");
   }
   System.out.println(br.readLine());
   System.out.println((char)br.read());
   System.out.println((char)br.read());
   ```

19. Initialize the following:
   A string called “testString” that contains the word “hello” with a new line afterwards
An integer called “rand” that stores a random int from 0, inclusive to 10, exclusive

A two dimensional array called “coords” that stores integers with the size of the first dimension being 5 and the size of the second dimension being 10.

Now, write a snippet of java code that will fill the “coords” 2D array with random integers between 1 and 10.

20. Name 2 number types in Java and their equivalent wrapper classes

21. What is the difference between a static variable and a non-static variable?
22. If x has already been declared as an integer, what would the output be when this statement is executed when x = 0 and when x = 1?

assert x == 1: "Oh noooooooooo!!!!!!"

23. Complete the following java class:

```java
public class ArrayListsRock {
    private ArrayList<String> myList;

    public ArrayListsRock(){
        //Initialize the ArrayList but do nothing else!
    }

    public void makeFirst(String first){
        //Set the first element in the arraylist to first
        //shifting the other elements down
    }
}
```
public void makeLast(String last) {
    // Set the last element in the arraylist to last
    // without changing any of the previous elements
}

public void changeAtIndex(int index, String change) {
    // Replace the element at index with change
}

public String toString() {
    // Print out the contents of the ArrayList, with one
    // string on each line
}