Java for Smartphone Development

Midterm

You are to finish the exam in two hours and email it to cislabs04@gmail.com by 9:35am Pacific Standard Time or 12:35pm Eastern Standard Time on Oct 22nd 2012. Timestamps on emails beyond 12:30pm will not be graded.

Please answer all questions. Each question is worth 10 points for a total score of 80 points.

Exam is open book and exams. You can use the Internet got reference. Pl. do not copy and paste code snippets from online or from each other as it would be considered cheating. Your solutions will be searched against other submitted solution and Internet references and if a match is found, a grade F will be assigned at the end of semester.

Please submit your answers in a single word document.

Question 1:
Concept Questions:
a. Explain in your own words the role of JNI in enabling cross platform compatibility between Java and other programming languages?

Answer:

b. Can interfaces be used to exhibit polymorphism. Explain with a coded example

Answer:

Question 2:
a. How do you transfer input from a form to a JavaBean Variable? Explain your answer and write a short code snippet to demonstrate the concept.

Answer:

b. Explain how the hidden text fields can be used with Java?

Answer:

Question 3:
a. Write a function to compute the square root of a number to a precision of 4.

Answer:

b. Can a serialized object be transferred over a network? Write a complete class to show how this might be achieved.

Answer:

Question 4:
a. What is the role of response variable in JSP? Why is thread safety important in JSP and how it is achieved?
Answer:

b. Explain the meaning of deadlock and how can it be avoided? An explanation for this question would suffice (coding is not required).
Answer:

Question 5:
Assuming that the following classes have been defined:

```
public class A
{
      public static void method1()
      {
            System.out.println("A1");
      }
}

public class B extends A
{
      public static void method2()
      {
            System.out.println("B2");
      }
}
public class C extends B
{
      public static void method1()
      {
            System.out.println("C1");
      }
```

```
}
```

And assuming the following objects have been defined:

```
A a = new A();
B b = new B();
B other2 = new C();
```

In the table below, indicate in the right-hand column the output produced by the statement in the left-hand column. If the statement causes an error, fill in the right-hand column with either the phrase "compiler error"or "runtime error" to indicate when the error would be detected.

Statement	Output
a.method1();	_____
a.method2();	_____
b.method1();	_____
b.method2();	_____
other2.method1();	_____
other2.method2();	_____

Question 6:

In this question you will write two classes: Port and Ship. A Port is a city with a harbor. A Ship is an ocean-going vessel that travels between Ports. For the purposes of this question, we will assume that the world is flat, with every position specified by two coordinates x and y. The distance between two points (x1, y1) and (x2, y2) is given by the usual formula: square root of [(x1 - x2)2 + (y1 - y2)2].

A Port, when created, has a position. (Reminder: a position consists of two numbers.) It also has methods for finding out its position:

getX() returns its x coordinate.
getY() returns its y coordinate

A Ship, when created, has a name. In addition, it has these methods:
setPosition() takes as parameters an x coordinate and a y coordinate, and makes the Ship's position be (x, y).
setDestination() takes a Port as parameter and makes that the Ship's destination.
getDistance() returns the distance between the Ship and its destination Port.
toString() is the usual kind of toString, and returns a String giving the Ship's name and its distance from its destination.

Answer:

Question 7:

In this question, you must write part of a "main" method to solve a problem using two classes that you can assume are provided already.

Here are the classes that are provided. The contents of the methods are omitted, because you don't need to know how they work.

```
class Person {
 public int howManyChildren() { ... }
  // returns an integer that is the number of children the Person has

   public String getName() { ... }
       // returns the name of the Person
}

class PersonReader {
   public PersonReader() { ... }
  // a constructor - creates its own Reader object, and whatever else it
needs

   public Person readPerson() { ... }
   // reads enough input data to make an object of the class Person, and
returns that object. (This is like
   // Format's readLine( ) method, which reads and returns a String.
}
```

Complete the program below. It is intended to read the data about three people, storing each in an object of type Person. Then it prints the name of the Person with the largest number of children. Your code should handle case where two or more parents have the same number of children.

```
public class WhoHasTheMostChildren {
   public static void main (String[] args) {

….....

   }
}
```

Answer:

Question 8:

a. For each code segment below, determine how many times the body of the loop is executed. Write one of the following answers after each: 0, 1, in?nite, or > 1. Note that "> 1" means more than once but not in?nite.

(a)
```
for(int x=1; x<10; x++){
      System.out.println(x);
}
```

(b)
```
int x=1;
while(x<10){
      System.out.println(x);
```

```
}

(c) int x=1;
do{
      x = x*2;
} while(x>=8);

(d) int x=10;
while(x<10){
      System.out.println(x);
      x=x-1;
}

(e) int x=1;
    while(x!=10){
      x = x*2;
    }
```

b.
Complete the method sum that takes two arrays of integers as arguments. It returns null if either argument is null or if the arrays are not the same length. Otherwise it returns a new array, each of whose elements equals the sum of the corresponding elements in the input arrays. The input arrays should not be changed by the method.

Answer: