Sample 2009 Mid-semester Test

Time allowed: 40 minutes

This test has 5 pages (including cover) and 6 questions.
Each question is worth 5 marks, for a total of 30 marks

This test is worth a maximum of ten percent (10%) of your final mark in CITS1220 Software Engineering this year.

Write your answers, together with any working, directly onto the question sheet overleaf in the spaces provided. Provide brief answers of a few sentences.

Fill in your details below, but do not turn over this page until you are asked to do so

Family Name:________________________________________________________________

Given Name: :________________________________________________________________

Student Number: :____________________________________________________________
QUESTION 1  [5 marks]

Complete Javadoc documentation for the following Java method from a MobilePhone class:

```java
public void topUp(int amount) {
    if (amount <= 0) {
        throw new IllegalArgumentException(
            "topUp amount must be greater than 0 cents");
    } else {
        credit = credit + amount;
    }
}
```

QUESTION 2  [5 marks]

Sketch Java code to return the longest string from a given array of strings. For example, given
String[] name={"which", "word", "is", "the", "longest", "one"} then
longest(name) returns "longest" (since that has 7 characters).

```java
public String longest(String[] names) {
    // Your code here
}
```
QUESTION 3

[5 marks]

Consider the following fragment of a Java program.

```java
Customer c;
if (Math.random()<0.5)
    c = new CreditCardCustomer();
else
    c = new CashCustomer();
c.bill(34);
```

a) How are the classes Customer, CreditCardCustomer and CashCustomer related?

b) Assuming that CreditCardCustomer and CashCustomer have different bill() methods, explain how the Java interpreter chooses which method body to execute.

QUESTION 4

[5 marks]

Consider a simple Java Swing Graphical User Interface (GUI) that consists of a label with “Please enter name” on it, a text field which is empty and a button with “submit” written on it. A user is expected to type in the text field (possibly using backspace to correct mistakes) and then press the submit button. Some of the Java code to produce the GUI and its behaviour is written by the GUI programmer but much comes from the Java Swing library classes. Explain briefly what the programmer has to write. Note that you are not required to sketch the code, just to explain what is required.
This Java method \textit{inorder} accepts a date given by \texttt{day1} and \texttt{month1}, and compares that date with a second date given by \texttt{day2}, \texttt{month2}. The return value is true if \texttt{day1} of \texttt{month1} is earlier than \texttt{day2} of \texttt{month2} and false otherwise. An exception is thrown if either date is illegal (eg \texttt{day1}=30, \texttt{month1}=2).

Give a set of 5 to 8 test cases for the method \textit{inorder}. Show the inputs and expected outputs for each test case. For each test, state whether it tests normal, boundary or exceptional behaviour.
Summarise the information given by the UML class diagram below, using one or two sentences for each association between classes.