Please fill in your Student Number and, optionally, Name.	For Official Use
Student Number : _____	**Mark** : _____
Name : _____	**Marker** : _____

University of Cape Town ~ Department of Computer Science

Computer Science 1015F ~ 2008

Theory Test 2A

Question	Mark	Marker
1		
2		
3		
4		
5		
Total		

Marks : 30

Time : 40 minutes

Instructions:

a) Answer all questions.

b) Write your answers in the space provided.

c) Show all calculations where applicable.

Question 1: Boolean Expressions [8 marks]

a) What is the result of each of the following expressions? The result will be either true or false. Assume variable z = 6. **[4.5 marks]**

1. `z > 3 && z >=6`

   ……...

2. `z > 3 && z < 20`

   ……...

3. `z >=0 || z <2`

   ……...

4. `z > 0 && z < 5`

   ……...

5. `z < 7 && z==2`

   ……...

6. `z > 6 || z == 5`

   ……...

7. `z < 3 || z > 4`

   ……...

8. `z > 3 && z < 0`

   ……...

9. `z >= 5 || z < 0`

   ……...

b) Rewrite the following switch statement as nested `if-else` statements.

```
switch(choice)
{
        case 1: System.out.println("A");
                break;
        case 3: System.out.println("B");
                break;
        case 2:
        case 4: System.out.println("C");
                break;
        default: System.out.println("Z");
}
```

Write your code here

[3.5 marks]

Question 2: Loops [6 marks]

How many times does the while loop below execute for each of the different options for line 14?

```
11 int y = -3, x = 0;
12 while (x > y)
13 {
14     //insert code that alters the condition
15     if (x==11)
16             y=20;
17    x ++;
18 }//How many times did the loop execute?
```

a) Line 14 `x+=2;`

……

……

b) Line 14 `x *=2;`

……

……

c) Line 14 `x +=5;`

……

……

Question 3: Methods [4 marks]

Given the following code

```
public class ClassA
{
        method()
        {
                /*
                Variable declarations and other code is here
                */
                if (problem) //no point in continuing so
                                //we terminate the method
                        return; //terminate the method
                /*
                More code in here
                */
                return usefulDataValue;  //return some data value of
                                                //a particular data type
        }                               //end of method
}                                       //end of class declaration
```

a) Identify the program errors in the code fragment. All of the variables needed have been declared and initialized. (**Circle two options**).

1. The return data type for the method is not specified.
2. The formal parameter list is not specified (should be declared as void).
3. The method is attempting to return both a data type and a void type concurrently.
4. There should never be more than one return statement in any method
5. An access modifier is not specified.

[2 marks]

b) Write the abstract syntax of a method that returns a value

_____

_____

_____

_____

_____

[1 mark]

c) Write the abstract syntax of a void method that performs some actions rather than returning a value

[1 mark]

Question 4: Classes and Objects [4 marks]

If a class is created called Employee and one of the data fields (or instance variables) for the Employee class is a reference to a Date object.

a) What is the relationship between the Employee object and the Date object? **Circle your answer.**

1. The Date object is an Employee object.
2. The Employee object is a Date object.
3. The Employee object has a Date object.
4. The Date object has an Employee object.

[1 mark]

b) Write minimal Java code to illustrate the above description (i.e. create the Employee class, a private Date object such as employmentDate, and an accessor method to get the value of employmentDate)

[2 marks]

c) Write the body of the main method of a driver class to create an object of the Employee class.

[1/2 mark]

d) Write the body of the main method of a driver class to get the employed date `employmentDate` of the object.

[1/2 mark]

Question 5: [8 marks]

a) Consider the **Person** class below and add a constructor to the class that has four arguments that are used to initialize the instance variables.

```
public class Person
{
   private String name;
   private String month;
   private int day;
   private int year; //a four digit number.
```

[3 marks]

```
   }
```

b) Consider the driver class below, and add a statement to create an object called **`aPerson`** of type **Person** using your constructor above.

```
public class ConstructorsDemo
{

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


[1 mark]

```
 }
}
```

c) What is overloading?

[2 marks]

d) What is a static method?

[1 mark]