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

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) Identify the results of the following expressions. The result will be either true or false. Assume variable z = 6.

1. `z > 3 && z >=6` [1/2 mark] ……
……...[True]

2. `z > 3 && z < 20` [1/2 mark]……
……...[True]

3. `z >=0 || z <2` [1/2 mark] ……
……...[True]

4. `z > 0 && z < 5` [1/2 mark] ……
……...[False]

5. `z < 7 && z==2` [1/2 mark]……
……...[False]

6. `z > 6 || z == 5` [1/2 mark] ……
……...[False]

7. `z < 3 || z > 4` [1/2 mark] ……
……...[True]

8. `z > 3 && z < 0` [1/2 mark]……
……...[False]

9. `z >= 5 || z < 0` [1/2 mark] ……
……...[True]

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

```
if (choice ==1) {                                          [1 mark]
        System.out.println("A");
} else if (choice == 3){                                   [1 mark]
        System.out.println("B");
} else if ((choice == 2)| (choice ==4)) {          [3/2 mark]
        System.out.println("C");
} else {                                                          [1 mark]
        System.out.println("Z");
}
```

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; ……4 loops……[2 marks]

……..……..……..

b) Line 14 x *=2; …… infinite …… .[2 marks]

……..……..……..

c) Line 14 x +=5; …… ……2 loops …… [2 marks]

……...……..……..

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. (Choose two).

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.

Your answer:

---

1. The return data type for the method is not specified [1mark]

3. The method is attempting to return both a data type and a void type concurrently. [1mark]

If total < 2 marks then 5. An access modifier is not specified. [1/2 mark]

[2 marks]

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

---

public *Type_Returned Method_Name* (*Parameter_List*) { ….

return <expression that evaluates to *Type_Returned*>;}

[1 mark]

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

---

public void *Method_Name* (*Parameter_List*) { ….

return; //This is optional}

[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.

Your answer:

3. The Employee object has a Date object

[1 mark]

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

Write your code here

```
public class Employee { [1/2 mark]
        private Date employmentDate = new Date();[1/2 mark]
        public Date getEmploymentDate() {[1/2 mark]
                return employmentDate; [1/2 mark]
        }

}
```

[2 mark]

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

```
Employee anEmployee = new Employee ();
```

[1/2 mark]

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

```
Date employmentDate = anEmployee.getEmploymentDate();
```

[1/2 mark]