University of Cape Town ~ Department of Computer Science

Computer Science 1015F ~ 2007

Theory Test 2A

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: Multiple Choice. [5]

For each question, write down ONLY the letter of the correct answer.

a) The while stament is   [1]

    A. A branching mechanism

    B. A loop statement

    C. A Boolean expression

    D. All of the above

Answer: _____

b) Examine the following Java code: [1]

```
String a = "right",b= "left" ;
b = (a.length() <10) ? a : "overrun";
System.out.println(b);
```

   After executing this code, the value of the variable **b** is:

    A. "right"

    B. "left"

    C. "overrun"

    D. "a.length()"

Answer: _____

c) Which of the following operators has the *highest precendence*?   [1]

    A. &

    B. ||

    C. &&

    D. =

Answer: _____

d) Examine the following Java code: [1]

```java
boolean A=true, B=false, C=true, D=false;
System.out.print(A || B && C || D);
System.out.print( ! D && C);
```

When executing this code, the output is:

A. truetrue

B. truefalse

C. falsetrue

D. falsefalse

Answer: _____

e) Examine the following Java code: [1]

```java
int i=4;
System.out.print(i++ + " ");
System.out.println(++i);
```

When executing this code, the output is:

A. 5 5

B. 5 6

C. 4 4

D. 4 6

Answer: _____

Question 2: Short questions [6]

a) Explain why the following Java code does NOT result in a run-time error.

```java
int apples =0;
double horses =15.0;
if((apples>0)&&(horses/apples>1))
      System.out.println("Every horse has an apple!");
```
[2]

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b) What is an *inifite loop*?

[1]

_____

_____

c) Write down a n example of Java code that will result in an *inifite loop*.

[1]

_____

_____

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_____

a) Describe how you would rewrite the following code to use a `while` statement instead of a `do-while` statements. Note that the new code must behave exactly as the old version.

```java
double x;
 do {
    x = Math.random();
    if(x<0.5)
       System.out.println("Heads");
    else
       System.out.println("Tails");
 } while (x<0.5);
```
[2]

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Question 3:Longer questions[9]

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

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

[3]

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a) Now write a program to draw an arrow of a certain height, supplied by the user.

e.g. If the user supplied a height of 1, the output will be:

*

If the user supplied a height of 2, the output will be:

***

 *

If the user supplied a height of 3, the output will be:

*****

 ***

  *

And so on. You are given the outline of the program, just supply the missing lines of code.

```java
import java.util.Scanner;
   public class mystery
   {
      public static void main(String[] args)
      {
        Scanner keyboard = new Scanner(System.in);
        System.out.println("Enter the height of the triangle:");
_____

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_____
      }
   }
```

[6]