University of Cape Town
Department of Computer Science

Computer Science CSC115F

Class Test 2

- Answer all questions.

- All questions that refer to elements of programming make reference to the Java programming language as studied in class.

- Good luck !

Marks: 40

Time: 40 minutes

- Approximate marks per question are shown in brackets

- The use of calculators is permitted

Surname   Initials

NAME:

STUDENT NO: **COURSE CODE:** CSC

This paper consists of 4 questions and 5 pages (including this cover page).

Mark Allocation							
Quest	Marks	Internal	External	Quest	Marks	Internal	External
1	[10]			3	[14]		
2	[10]			4	[6]		
	Total				**Total**		
				Grand Total			
				Final Mark			
Internal Examiner:				**External Examiner:**			

Section 1. Java Basics

Question 1.   **[10 marks]**

a) What is a class?

_____

_____

_____

[2]

b) What is a variable?

_____

_____

_____

[2]

c) Why do we have 4 types of integers instead of just one?

_____

_____

_____

[2]

d) Write a single line of code to declare **fakePi** as a *double* constant with a value of 4.14159.

_____

_____

_____

[2]

e) Write a single line of code to show how "Thabiso" is passed as the single *String* parameter to the **setName** method of the **Chief** object.

_____

_____

_____

[2]

Question 2.   **[10 marks]**

a) Which of the following are valid identifiers? Indicate YES or NO for each.

```
_class_ _____
count+1 _____
$$Test2 _____
```

[3]

b) What is the output of the following fragment of code? (Include carriage returns where necessary)

```
System.out.print ("the ");
 System.out.print ("meaning"+"\n"+" ");
  System.out.println ("of");
   System.out.print ("  life");
```

_____

_____

_____

_____

[2]

c) What is the value of each of the listed expressions, given the following initial piece of code? (Remember to use a decimal point for floating point values)

```
int a = 10;
float b = 2.0;
int c = a;
```

```
b+13                  _____
c/3                   _____
20-a%3                _____
a=5                   _____
((12*2)-4)/(2+3)      _____
```

[5]

Section 2. Number Systems and Logic

Question 3.   **[14 marks]**

a) Convert 37_{10} into its binary representation. Clearly indicate your final answer.

_____

_____

_____

_____

_____

_____

_____

_____

[3]

b) Convert 11001001_2 into its hexadecimal representation.

_____

_____

[1]

c) Convert 1100.1100_2 into its decimal representation.

_____

_____

_____

_____

[2]

d) Use 8-bit 2's complement binary arithmetic to calculate: $37_{10} - 4_{10}$. Show all calculations (except binary↔decimal) and convert your answer back into decimal.

_____

_____

_____

_____

_____

_____

_____

_____

[4]

e) What is the decimal value of the following number, represented in single precision IEEE 754 format? Your final answer should not be in scientific notation.

```
0  01111110  11100000000000000000000
```

[4]

Question 4. [6 marks]

a) Why is Unicode preferred over ASCII?

[2]

b) In the context of boolean algebra, fill in the missing values in the following truth table:

A	B	$\overline{A}$	$A.B$	$\overline{A} + (A.B)$
0	0		0	
	1	1		1
1	0		0	0
	1	0		

[4]