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**University of Cape Town ~ Department of Computer Science**

**Computer Science 1015F ~ 2007**

## **Theory Test 1A**

**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: Introduction to Computing [10]**

a) What is the difference between hardware and software? [2]

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b) What is the purpose of each of the following hardware components of a modern computer: [2]

i. CPU

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ii. Hard drive

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c) What is the difference between a low-level language and a high-level language? [2]

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d) Give 2 examples of low-level programming languages. [1]

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e) In your own words, describe an algorithm for answering this test paper. List at most 6 steps. [3]

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## Question 2: Multiple Choice. [10]

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

- a) The Java compiler: [1]
- A. Translates object code to source code.
  - B. Is another name for the Java Virtual Machine.
  - C. Translates byte-code into machine language.
  - D. Translates source code into object code.

Answer: \_\_\_\_\_

- b) Examine the following Java expression: [1]
- ```
char initial = 'M';
```
- The *identifier* in this expression is:
- A. 'M'
  - B. char
  - C. initial
  - D. ;

Answer: \_\_\_\_\_

- c) Examine the following Java expression: [1]
- ```
char initial = 'M';
```
- The *constant* in this expression is:
- A. 'M'
  - B. char
  - C. initial
  - D. ;

Answer: \_\_\_\_\_

d) Which of the following Java expressions shows an example of *initializing a variable*? [1]

- A. `int count = 15;`
- B. `interest *= 2.2;`
- C. `count= (int) interest;`
- D. `count++;`

Answer: \_\_\_\_\_

e) Which of the following Java expressions shows an example of *type casting*? [1]

- A. `int count = 15;`
- B. `interest *= 2.2;`
- C. `count= (int) interest;`
- D. `count++;`

Answer: \_\_\_\_\_

f) Which of the following Java expressions shows *the increment operator*? [1]

- A. `int count = 15;`
- B. `interest *= 2.2;`
- C. `count= (int) interest;`
- D. `count++;`

Answer: \_\_\_\_\_

g) Which of the following operators has the *highest precedence*? [1]

- A. `--`
- B. `*`
- C. `%`
- D. A and C

Answer: \_\_\_\_\_

h) Examine the following Java expression:

```
String str1 = "Buffy the vampire slayer";
```

What is the *object* in this expression?

[1]

- A. "Buffy the vampire slayer"
- B. String
- C. str1
- D. ;

Answer: \_\_\_\_\_

i) Examine the following Java expression:

```
double mystery = 5/2 + 3.0/2.0;
```

What will be the value of `mystery` after executing this expression?

[1]

- A. 3.5
- B. 2.75
- C. 4.0
- D. none of the above

Answer: \_\_\_\_\_

j) Which of the following people was the first Computer Science Man of the Year?

[1]

- A. Charles Babbage
- B. Alan Turing
- C. Grace Hopper
- D. Howard Aiken

Answer: \_\_\_\_\_

**Question 3: Java Basics [5]**

a) What is *byte-code*? [1]

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b) Explain briefly why Java byte-code makes a Java program very portable. [2]

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c) Explain the difference between a *class* and an *object*, giving an illustrative example of each. [2]

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#### Question 4: Strings [5]

For each question below, write down just the output produced by the listed lines of program code.

a) `String greeting = "Hey diddle diddle!";`  
`String testStr = "did";`  
`int count = greeting.indexOf(testStr);`  
`System.out.println("The string is at " + count);` [2]

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b) `String str1="Ba",str2="Na";`  
`str1+=str1;`  
`System.out.println(str1);`  
`str1 += str2;`  
`System.out.println(str1);`  
`int count = str1.length();`  
`System.out.println("Size:" + count);` [3]

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