

The American University in Cairo
Department of Computer Science & Engineering
CSCI 106-02

Dr. KHALIL	Quiz-II	Fall 2010
Last Name :		ID:
First Name:		Form – I

EXAMINATION INSTRUCTIONS

- * Do not turn this page until asked to do so.
- * Exam time is **40** minutes.
- * Put the answers on the same question sheet, do not use any additional papers, even for scratch.
- * Write your name, ID, section no. in the indicated places.
- * Read the exam instructions.
- * Read the honesty policy.
- * Sign the following statement.

Academic Integrity Policy

Cheating in Exams is a violation of the Academic Integrity policy of AUC. Whispering, talking, looking at someone else's paper, or copying from any source is considered cheating. Any one who does any of these actions or her/his answers indicates that she/he did any of them, will receive a punishment ranging from zero in this exam to failing the course. If repeated, it may lead to dismissal from AUC.

I have read the honesty policy and exam instructions and I am presenting this exam as entirely my effort.

Signature: _____

DO NOT USE THIS SECTION

Question	Points	Grade
1	10	
2	10	
3	10	
4	20	
Total	50	

Question 1 (10 points)

Trace the following C++ program; i.e., show the effect of each numbered statement using the given table.

```
#include <iostream>
#include <cmath>
using namespace std;

void main () {
    float a = 3.5, b = 1.0, c = 2.5;           // statement 1
    int x = 5, y = 3.5, z, s, t;              // statement 2
    const int two = 2;                        // statement 3
    c = (x + y) / x * a;                      // statement 4
    z = y % x + sqrt(b) / two;                // statement 5

    if (x % y == 0)                           // statement 6
        s = (two * b + pow(x, y)) / (two * b); // statement 7
    else
        s = (two * b + pow(y, two)) / (two * b); // statement 8

    t = y / x * a + two * pow(two, y);        // statement 9

    cout << "z = " << z << endl;             // statement 10
    cout << "c = " << c << endl;             // statement 11
    cout << "s = " << s << endl;             // statement 12
    cout << "t = " << t << endl;             // statement 13
}
```

Use the following table to trace the given program (i.e., to plot the value of different variables as instructions are executed one after the other and finally showing the output).

Statement Number	a	b	c	x	y	z	s	t
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

Question 2 (10 points)

Draw the evaluation tree for the following expressions:

$$r = (-b + 4 * a * c) / (2 * a)$$

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

Question 3 (10 points)

Show the output of the following program:

Program	Output
<pre># include <iostream> using namespace std; void main() { int num = 409, d; const int ten = 10; d = num % ten; cout << "The new Number = " << d; num = num / ten; d = num % ten; cout << d; d = num / ten; cout << d << endl; }</pre>	

Question 4 (20 points)

In an experiment, a distance is measured in centimeters (cm). Write a complete C++ program that reads the distance (in cm) and display it in kilometers (km), meters (m) and centimeters (cm). Also, the whole distance should be converted into an amount of kms rounded to the nearest hundredth.

(Hint: $1\text{km} = 1000\text{ m}$, $1\text{m} = 100\text{ cm}$)

Print an error message if a zero or a negative value was entered for the distance.

Be sure to use proper formatting and appropriate comments in your code. The output should be clearly labeled. Show the three phases of software development: the analysis, design (draw a Flow Chart), and implementation.

The Analysis

[illegible]

The Flow Chart

[illegible]

[illegible]

5