

The American University in Cairo
Department of Computer Science & Engineering
CSCE 106-03&04&09

Dr. KHALIL	Quiz-II	Fall 2012
Last Name :		ID:
First Name:		Form – I Section No.: ()

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	5	
3	10	
4	10	
5	15	
Total	50	

Question 1 (10 points)

Draw a Flowchart for the following C++ program and show its final output:

<pre>#include <iostream> #include <string> using namespace std; void main() { int num = 99; string msg; const int two = 2; if (num % two == 1) msg = "Odd"; else msg = "Even"; cout << "The number " << num << " is " << msg << endl; system ("pause"); }</pre>	The Flowchart
Output	

Question 2 (5 points)

Write a C++ statement to compute the real roots R1 and R2 of a quadratic equation $ax^2 + bx + c = 0$. The real roots are calculated according to the following formulas:

$$R1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

$$R2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

In C++

.....

.....

Question 3 (10 points)

The following C++ program takes the distance between Earth and Mars as a large integer number of centimeters (**cms**) and displays it as an integer number of kilometers (**km**), an integer number of meters (**mm**) and an integer number of centimeters (**cm**), if any. The program displays an error message and terminates in case the user enters a negative value for the distance (**cms**).

There are some missings (represented by dots) in the given program. Complete these missings such that the program could be compiled and run correctly.

The Program

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

void main()
{
    // Declaration
    ..... cms;    // cms is the distance as a large integer number of centimeters
    ..... km, mm, cm, rem; // rem is a remainder
    const ..... km_to_cm = 100000;
    const ..... mm_to_cm = 100;

    // Input
    cout << "Enter the distance as a large integer number of centimeters: ";
    cin >> .....

    // Processing and Output
    if ( ..... )
    {
        .....
        km   = .....
        rem  = .....
        mm   = .....
        cm   = .....
        cout << "The number of kilometers = " << ..... << endl;
        cout << "The number of meters = " << ..... << endl;
        cout << "The number of centimeters = " << ..... << endl;
        .....
    }
    else
    {
        cout << "Error!!, the entered value is negative!!" << endl;
        system ("pause");
    }
}
```

Question 4 (10 points)

Show the output of the following C++ program:

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

void main()
{
    int num = 708, s = 0, d;
    const int ten = 10;

    d = num % ten;
    s = s + d;
    num = num / ten;
    d = num % ten;
    s = s + d;
    d = num / ten;
    s = s + d;
    cout << "The final result = " << s << endl;
    system ("pause");
}
```

The Output

Question 5 (15 points)

Write a C++ program that computes and outputs the volume of a pyramid, given the area of its base (**area**) and its height (**height**). The formulas for computing the volume of pyramid is:

$$\text{Vol_Pyramid} = 1 / 3 * \text{area} * \text{height}$$

Print an error message if the user enters a zero or a negative value for the area

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

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The Flow Chart

[illegible]

The Program

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.

