

The American University in Cairo
Department of Computer Science & Engineering
CSCE 106-03&08

Dr. KHALIL	Exam-I	Spring 2011
Last Name :		ID:
First Name:	Form – I	Section No.:

EXAMINATION INSTRUCTIONS

- * Do not turn this page until asked to do so.
- * Exam time is **60** 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	20	
3	20	
Total	50	

Question 1 (10 points)

Show the output of the following program:

```
float a = 2, b = 2, c = 1.5, x;  
int d = 5, e = 4.5, y, z;  
  
x = a * b - c + d / e;  
y = a * (b - c) + d / e;  
z = a * (b - (c + d - 0.5) / e);  
  
cout << "x = " << setw(4) << x << " y = " << setw(4)  
<< y << " z = " << setw(4) << z << endl;
```

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

void main()
{
    int num = 101, d, s = 0;
    const int ten = 10;
    d = num % ten;
    s = s + d;
    num = num / ten;
    d = num % ten;
    s = s + 2 * d;
    num = num / ten;
    d = num % ten;
    s = s + 4 * d;

    cout << "The final result is " << s << endl;
}
```

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Draw a Flow chart and write a complete C++ program that asks the user to enter integer number greater than or equal to 0 and less than 1000. The program has to check the entered number and if it is out of the given range, it prints out an error message **Invalid Input**, otherwise if it is less than 10, write out the words **ONE DIGIT BIG!**, If it is between 10 and 99, write out the words **TWO DIGITS BIG!** and if the user's number is greater than 99, write out the phrase **THREE DIGITS BIG!**.

The Analysis

The Flow Chart

[illegible]

Question 3 (20 points)

Write a C++ program that computes and outputs volume of a cone and area of its base, given the diameter of its base and its height. The program should validate the user input to accept only values that are greater than 0 for both diameter and height and displaying an error message in case of violating these conditions.

The formulas for computing the cone's base area and volume are:

Area of base = $\pi \times \text{Radius}^2$

Volume of cone = $\frac{1}{3} \times \pi \times \text{Radius}^2 \times \text{Height}$

Print both computed values to the nearest tenth. 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

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