

The American University in Cairo
Department of Computer Science & Engineering
CSCE 106-05&07

Dr. KHALIL	Quiz-III	Spring 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	25	
3	15	
4	25	
Total	70	

Question 1 (10 points)

1. Write a C++ loop to print out a list of all the integer numbers that are divisible by 5 but not divisible by 9 in the range 200 to 500 (inclusive).

.....

.....

.....

.....

.....

2. Give the most simplified equivalent expression for each of the following Boolean expressions:

(x != x) && true

(x != 7) && (x == 7)

(y == 5) || true

Question 2 (25 points)

Show the output of each of the following program segments:

<pre>int a = 5, b = 7, c, d; c = a++ / 2; cout << "c = " << setw(4) << c << endl; d = ++a / b--; cout << "d = " << setw(4) << d << endl;</pre>	
<pre>x = 5; y = 30; while (x >= y) x = 2 * x; cout << setw(3) << x << setw(3) << y << endl;</pre>	
<pre>float a = 12.3456, b = 65.4321, c = 99.999; cout << setprecision(2) << "a = " << setw(6) << a << endl; cout << "b = " << setw(6) << b << endl; cout << "c = " << setw(6) << c << endl; cout << setprecision(1) << "a = " << setw(6) << a << endl; cout << "b = " << setw(6) << b << endl; cout << "c = " << setw(6) << c << endl;</pre>	
<pre>for (int k=2; k < 15; k++) if ((k % 3) == 0) && (k % 5 == 0) cout << setw(3) << k; cout << endl; cout << "End Value = " << k << endl;</pre>	

<pre> int k = 5; while (k > 10) { if ((k % 2) == 0) cout << k << endl; k++; } cout << "Final Value of k = " << k << endl; </pre>	
<pre> Int x = 5; y = 50; do x = x + 10; while (x > y); cout << setw(3) << x << setw(3) << y << endl; </pre>	

Question 3 (10 points)

Draw the Flow Chart and show the output of program segments:

<pre> int a = 5, b = 8, c = 7; string msg; if ((a > b) && (a > c)) msg = "First Number"; else if (b > c) msg = "Second Number"; else msg = "Third Number"; cout << msg << endl; </pre>	<u>Flow Chart</u>
<u>Output</u>	

Question 3 (15 points)

The following 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. The computed values are printed rounded to the nearest hundredth. The formulas for computing the cone's base area and volume are:

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

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

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

```
#include <iostream>
.....
using namespace std;
void main()
{
    float height, diameter, radius, area, volume;

    .....    pie = 3.14;

    cout << "Enter a value greater than zero for the diameter: ";
    cin >> diameter;

    while ( ..... )
    {
        cout << "Invalid diameter value, please re-enter another: ";
        .....
    }

    cout << "Enter a value greater than zero for the height: ";
    cin >> height;

    while ( ..... )
    {
        .....
        .....
        .....
        .....

        radius = diameter / 2;

        area = .....;

        volume = .....;

        cout << ..... << "The Area of Base = " << ..... << endl;

        cout << "The Volume of Cone = " << ..... << endl;
    }
}
```

Write a C++ program that takes an integer number representing the age of a person and printing a message indicating his/her age standing according to the following rules:

The program accepts only an integer value for the Age that is greater than 0 and not more than a 100.. Show the three phases of software development: the analysis, design (draw a Flow Chart), and implementation. You have to write the program once using nested-if structure and second using the switch structure.

[illegible][illegible]

The Program Using the nested-if structure

The Equivalent switch structure of the nested-if