Future University in Egypt
Faculty of Computers and Information Technology

Department: Computer Science
Course Name: Programming I
Course Code: CSC112
Instructor: Dr. Awad Khalil **Date: 18/11/2019**
Allowed Time: 90 minutes **Total Marks: 100**
No. of Pages: 5 **Semester: Fall 2019**

Mid-Term Exam II

Student Name: .....

Student ID: .....

Question No.	Question Mark	Student Mark	Marks in Words
1			
2			
3			
4			
5			
Total	100		

Exam Committee Signature

Question 1 (20 points)

Write the C++ arithmetic statement(s) for each of the following algebraic formulas:

Algebraic Formula	C++ arithmetic statement
$V = \frac{1}{3}\pi r^2$	
$R1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$	

Question 2 (20 points)

Show the output of the following program segments:

```
double a = 2.5,  z = 5.67;
int  d = 7, e = 5.5;
if ( e > 5 )
     cout << "Error!!" << endl;
else
     {
      z = (e + 1) / d + 2.13;
      cout << "z = " << z << endl;
      z = d % (e + 1) * a + 3.16;
      d = (d + 5) / e + a;
      cout << "d = "  << d << endl;
      cout << "z = "  << z << endl;
      }
```

```
int d, s = 0, n = 340069, sm = 9, c = 0;
const int ten = 10;
do
{     d = n % ten;
      if (d % 2 != 0)  s = s + d;
      if ( d < sm )      sm = d;
      if ( d == 0 )      c++;
      n = n / ten;
} while (n != 0);
cout << "Value1 = " << setw(3) << s << endl;
cout << "Value2 = " << setw(3) << sm << endl;
cout << "Value3 = " << setw(3) << c << endl;
cout << "Value4 = " << setw(3) << n << endl;
```

```
int n = 29;
const int two = 2;
cout << "Equivalent value of " << n << " = ";
while ( n != 0 )
{     cout << n % two;
      n = n / two;
 }
cout << endl;
```

```
for (int k = 1; k <= 15;  k++)
   if (( k % 5 == 0 ) && ( k % 3 != 0 ))
         cout <<   setw(4) << k;

cout << "Done!!" << endl;
```

Question 3 (20 points)

1. Draw the Flowchart of the following program and show its final output:

```
int a = 33.5, b = 99.25, c = 77.4, s, g;

if ( c < a )
    {
      s = c;
      g = a;
    }
else
    {
      s = a;
      g = c;
     }
  if ( b < s )
     s = b;
  if ( b > g )
     g = b;
cout << "Value 1 = " << setw(3) << s << endl;

cout << "Value 2 = " << setw(3) << g << endl;
```

Program Output:

FlowChart

Question 4 (20 points)

1. Write only the C++ loop to generate each of the following sequences:

5 7 10 14 15 20 21 25 28 30 35 40

2 1 1 2 0 2 0 1 1 0 2 1

2. Write only the C++ **main** function that takes and validates a positive integer number between 999 and 999999 to compute and displays the sum and count of the even digits that are not divisible by 3.

Question 5 (20 points)

The Weather Status (WS) is determined based on the Temperature of the day (T) according to the following rules:

Temperature (T)	Weather Status (WS)
T < 10	Cold
10 <= T < 20	Fresh
20 <= T < 40	Hot
T >= 40	Too Hot

Write a C++ program that takes and validates the Temperature (T) of the day between 0 and 50 (inclusive) to compute and display the Weather Status (WS) in proper format.

The Program

Best of LUCK