AFRICA UNIVERSITY
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COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE (CBPLG)

PROGRAMMING 2 –CIS 203

END OF SECOND SEMESTER EXAMINATIONS

MAY/JUNE 2020

LECTURER: Mr. Timothy Makambwa

DURATION: 48 HOURS

INSTRUCTIONS

Answer ***One*** question from this examination.

Run all programs on Visual Studio and then copy them on Ms Word

Start **each** question on a new page on your answer sheet.

The marks allocated to **each** question are shown at the end of the section.

All codes should in C# Programming language

Question One

a) Write a program that converts a given number from decimal to binary notation (numeral system). [5]

b) Write a program that converts a given number from binary to decimal notation. [5]

c) Write a program that converts a given number from decimal to hexadecimal notation. [5]

d) Write a program that converts a given number from hexadecimal to decimal notation. [5]

e) Write a program that by a given integer N prints the numbers from 1 to N in random order. [5]

f) Write a program that given two numbers finds their greatest common divisor (GCD) and their least common multiple (LCM). You may use the formula LCM(a, b) = |a*b| / GCD(a, b). [7]

g) Write a program that reads from the console number N and print the sum of the first N members of the Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377,..[8]

h) Write a program that gets the coefficients a, b and c of a quadratic equation: $ax^2 + bx + c$, calculates and prints its real roots (if they exist). Quadratic equations may have 0, 1 or 2 real roots. [10]

Question Two

Write a:

a) Program to Check whether the Entered Number is Even or Odd [5]

b) Program to Perform Celsius to Fahrenheit Conversion [5]

c) Program to Find a Number using Pythagoras Theorem [5]

d) Program to Find the Sum of first 50 Natural Numbers using For Loop [5]

e) Program to generate Armstrong numbers in a given range [5]

f) Program to calculate the diameter and area of a circle given its radius [10]

g) Write a program that prints all the multiples of 17 less than 100 [5]

h) Write a program that display all the factors of an entered number [5]

i) Write a program to illustrate the trigonometry angles in degrees [5]

Question Three

Part One

Create a simple calculator that prompts the user for 2 numbers, and then asks the user what the operation that you want it to perform is. The calculator must be able to do the following operations:

- Addition
- Subtraction
- Multiplication
- Division
- Exponentiation (Number multiplies by itself)

At the end, the calculator must ask the user if he wants it to perform another calculation, and do so if he does. **Tips:** Use a "for" loop for the exponentiation, and a variable that holds the user's answer to perform another operation at the end along with a "while" loop. [30]

Part Two

a) C# Program to Display Numbers in the form of Triangle

```
      1
     1 1
    1 2 1
   1 3 3 1
  1 4 6 4 1
 1 5 10 10 5 1
1 6 15 20 15 6 1
```

b) C# Program to Convert Decimal to Binary

[10+10]

END OF PAPER