**Computer Science Programming and Principles 1**

**Final Exam**

Date: 26/08/2017 Total marks: 40

Time: 4 hours

**Section 1: (Each question carries 5 marks)**

1. Given N positive integers, find the minimum and maximum values that can be calculated by summing exactly K of the N integers.
2. Write a recursive python program in finding the digit sum.

Example: 1234 = 1 + 2 + 3 + 4 = 10 = 1 + 0 = 1

1. Write a python program to find whether the given string is funny or not? Funny is, given a string S, R is the reverse of the given string and find the absolute differences of these pairs | S[i] – S[i-1] | = |R[i] – R[i-1] | should be equal.
2. Find the kth occurrence of the string in the given string.
3. You are given an array of N integers which is a permutation of the first N natural numbers. You can swap any two elements of the array. You can make at most K swaps. What is the largest permutation, in numerical order, you can make?
4. Write a python program to implement the following.

A Person class with the attributes, firstName, lastName, idNumber. The printPerson() method should print the values of the person attributes in the following format.

**Name: Memelli, Heraldo**

**ID: 8135627**

A Student class that inherits from the Person with the attributes an integer array of scores obtained in 3 different subjects.

A *char calculate()* method that calculates a Student object's average and returns the grade character representative of their calculated average

Letter Grade Average

Ex =95 and above.

A+ >=90 and <95

A >=85 and <90

B+ >=80 and <85

B >=75 and <80

C >=70 and <75

The printStudent() method prints the values of the student’s attributes in the following format.

**Name: Memelli, Heraldo**

**ID: 8135627**

**Grade: A+**

**Section 2:**

**1.**

**def function1(n):**

**for i in range(n):**

**for j in range(n):**

**for k in range(1, n, n/2):**

**print “hello”**

**2.**

**def function2(n):**

**return n\*n**

**3.**

**def function(n):**

**for i in range(n):**

**for j in range(n):**

**print “Hello”**

**for i in range(n):**

**for j in range(n):**

**k = 1**

**h = 0**

**while k<=n:**

**print “hello”**

**k = 2 \*\* h**

**h += 1**

**4.**

**def func4(n):**

**for i in range(math.sqrt(n)):**

**print(“Hello”)**