**Computer Science Programming and Principles 1**

**Mid Exam – 3**

Date: 19/08/2017 Total marks: 30

Time: 4 hours

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

1. Write a python program to calculate exponent of a given number and compute the digit sum of the result.
2. Write a python program to find the median of the given list of numbers. Use Mergesort to sort the elements of the list.
3. Write a python program to implement the following operations for Wallet class.

Data Attributes of the wallet class should be: amount.

Behaviors of the Wallet class should be as follows.

1. addMoney() #Adding money to the wallet.

2. payMoney() #Paying money from the wallet.

3. checkBalance() # Return the current amount from the wallet.

Note: Don't consider negative numbers, when adding or paying money.

Note: money can be float (23 rupees 43 paisa = 23.43)

Ex: input wallet.add(9)

Ex: output wallet.check() //should return 9

1. Write a python program to implement the following operations for Set class.

Data attribute of the set should be: list

Behaviors of the set class should be as follows.

1. addElement(element) # Adds the element to the set if it not in the set.

2. union(other): # performs union of two sets and returns a new set.

3. intersect(other): # perform intersection of two sets and returns a new set.

Example:

S1.addElement(1) = (1)

S1.addElement(2) = (1, 2)

S2.addElement(1) = (1)

S2.addElement(3) = (1, 3)

S1.union(S2) = (1, 2, 3)

S1.intersect(S2) = (1)

**Section 2: (Each question carries 2 marks)**

Give the number of steps and the time complexity in Big Oh notation for the following code snippets.

1.

n = int(input())

s = 0

for i in range(n):

s = s + i

print(s)

2.

n = int(input())

for i in range(n):

for j in range(n):

print(“Hello World!!”)

3.

n = int(input())

i = 1

while(i<=n):

print(“Hello World!!”)

i = i \* 2

4.

n = int(input())

for i in range(n):

for j in range(i):

print(“Hello World!!”)

5.

n = int(input())

i = n

while(i>0):

print(“Hello World”)

i = i / 3