MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

IV SEMESTER B.TECH. (COMPUTER AND COMMUNICATION ENGINEERING)
END SEMESTER EXAMINATIONS, APRIL 2018

SUBJECT: ADVANCED PROGRAMMING TECHNOLOGIES [ICT 2252]
REVISED CREDIT SYSTEM
(19/04/2018)

Time: 3 Hours   MAX. MARKS: 50

Instructions to Candidates:

❖ Answer ALL the questions.

❖ Missing data may be suitably assumed.

1A. Write a Python program to do the following: 5
    i. Create a RestaurantMeal class that holds the name and price of a food item
       and quantity served by a restaurant.
    ii. Create a HotelService class that holds the name of the service, the service fee
        and the room number to which the service was given.
    iii. Define the function display in each of the above classes to display the values
         of data members.
    iv. Create a RoomServiceMeal class that inherits from both RestaurantMeal and
        HotelService. Whenever a RoomServiceMeal object is created Rs. 100 is
        added as the room service charge.
    v. Display total price of food items and service charge separately.

1B. Write a Python function to Reverse an array in groups of given size.   3
    Example : arr = [1, 2, 3, 4, 5, 6, 7, 8, 9]
    For k = 3, expected output is [3, 2, 1, 6, 5, 4, 9, 8, 7]

1C. Write a Ruby program to remove the punctuations from the string.
    [Consider " , / : ; ! as punctuations]   2

2A. Write a Python program to do the following   5
    i. Read the dictionary from user. Key should be random number generated by
       the program [Note: *import random random.randrange(0,100) generates*
       random number between 0 to 99.]
    ii. Find the average of all the values if the values are numbers and display the
        result.
    iii. Concatenate if the values are strings and display the result.
    iv. Search the dictionary based on value which is a string.
    v. Display the non-numeric and non-string dictionary values as they are.

2B. Write a Python program to sort a list having tuple as its elements, also sort the list in   3
    increasing order by the last element in each tuple.

2C. What is the output of the following code?   2
    Games = {}
    Games[(1,2,4)] = 8
    Games[(4,2)] = 10

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```
sum = 0
for k in Games:
    sum += Games[k]
print (len(Games) + sum)
```

3A. Create a Python class and separate methods to do the following, without using built-in functions / methods: `5`
  i. Convert integer to Roman Number
  ii. Convert Roman number to integer
  iii. Convert integer to octal
  iv. Convert integer to hexadecimal.

3B. Write a python program to do the following. `3`
  i. Read the order of two matrices.
  ii. Read the values and store nonzero values in to the dictionary.
  iii. Add the matrices represented in the dictionary form and display the result in two dimensional matrix form.

3C. What is the output of the following code? `2`
```
def f1(x=3,y=4):
    return x+y, x-y
x, y=f1(y=2,x=1)
print(x,y)
```

4A. Write a Python program to do the following. `5`
  i. Read 'n' strings
  ii. Count the number of strings with same first and last characters and having the string length of 2 or more
  iii. Display the strings having odd length
  iv. Display all palindromes
  v. Create a dictionary which stores key as string and the value is the total number of vowels in the string

4B. List and explain the datatypes and expressions of Ruby. Give an example for each. `3`

4C. Write a Python program to convert a list of characters into a string without using built-in functions / methods. `2`

5A. Write a Ruby program to do the following: `5`
  i. Create class named Student with Name, Internal Marks array with 5 entries, External Marks array with 5.
  ii. Write proper initialization functions.
  iii. Write a function total_marks to display the total marks of five students.
  iv. Write a function to validate the registration number of the candidate. The register number of the candidate is a string of length 10. It is of the form 1999CCE023. In this 1999 signifies year of joining. CCE is course code and 023 is the number assigned to the student. Year is in the range 0000 to 9999. If the year is not in the specified range or the register number is not in the specified format display an error message.

5B. Differentiate deep copy and shallow copy. Give an example for each. `3`

5C. What is the output of the following code? `2`
```
>>>L1=[1,2,3]
>>>L2=[4,5,6]
>>>[x*y for x in L1 for y in L2]
```