Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

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A Constituent Institution of Manipal University

IV SEMESTER B.TECH. (COMPUTER AND COMMUNICATION ENGINEERING)
END SEMESTER EXAMINATIONS, APRIL 2017
SUBJECT: ADVANCED PROGRAMMING TECHNOLOGIES [ICT 2252]
REVISED CREDIT SYSTEM
(21/04/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer ALL questions.
- Missing data may be suitably assumed.

1A. Write a Python program to do the following:

i. Initialize and use ItemDictionary, which has ItemId as key and itemName, price as value, in the global scope.

ii. Create a Python class named ShoppingCart, which has cart of type dictionary as class variable. Make the cart to store list of items purchased by a customer by storing all the necessary details.

iii. An order may include multiple items. Each item may have multiple quantities.

iv. Write the methods addItem, RemoveItem which adds and removes an item from the cart respectively.

v. Define the class method to display the list of items purchased and total amount of the purchase. 5

vi. Write the menu driven code to add, remove and display cart. 3

1B. What are lambda functions? Explain with an example.

1C. Implement your own flatten which works same as the in-built flatten method of Ruby's Array class. Don't directly use in-built flatten function. 2

2A. Farmer's market information is stored in a file which has FMID (Farmer Identification number), market name, web address, street address, city, state, zip code, x-coordinate, and y-coordinate as fields. Write a Python program to do the following:

i. Define the class and the comparator functions namely __eq__(), __gt__(), __lt__() , __ne__(), __ge__(), __le__(), These functions define object ordering based on FMID value.

ii. Define a function get_market_list(filename) that takes the filename as its input and returns a list of all the farmers market instances which are present in the file.

iii. Using above defined functions compare the objects and display the result. 5

2B. Using dictionary as cache, write a function named compute, which takes 2 parameters and computes the sum of the squares of those numbers and returns the result. Print the content of the dictionary. 3

2C. What type of values can be stored in a Python set? List the datatypes which could become a set member. What is the necessity of using frozenset and how is it different from set? 2

3A. Write a Ruby program to do the following:

i. Read the string.

ii. Create an array by dividing the string into two halves. First item is the first half of string and the second item is the second half of the string.

iii. If the length of the two items are not same, then the longer half should appear as the first item in the array.

iv. From the constructed array, create two hashes based on the character count Example: l1=["hello , TT"] →d1={h=>1,e=>1,l=>2,o=>1}, d2={T=>2}

v. Combine both the hashes and display the result. 5

3B. Write a Python program that computes the minimum number of notes and coins needed for the given input. [Example Rs 5/- would need one Rs 5/- note or five Rs 1/- note / coin and so on. Minimum number of note needed is 1 that is one Rs 5/- note.] 3

3C. Write a Python program to find the union, intersection and difference of two lists without using any of the type casting functions, built-in functions and built-in methods. Input lists contain only integer values. Example if L1=[1,2,3,4,5,6] and L2=[4,5,6,7,8] , then union=[1, 2, 3, 4, 5, 6, 7, 8], inter=[4, 5, 6] and diff=[1,2,3]. 2

4A. Write the Python program to define a class named Employee. Include the instance variables id, name, salary and department. Each employee's id should be auto generated, in the order of creation, starting from 4982. Define constructor, destructor, display method and a class method to compute total salary of all the employees. Read the details of 'n' employees from user and store created 'n' objects in a list. Implement a search function which displays the details of an employee after reading his id from user. 5

4B. Write a Python program to place the characters in a string into three different sets namely char, digit and symbol. Place the alphabets (lowercase and uppercase) into char set, place the digits into digit set, place non-alphanumeric characters into symbol set. Read input string from user. Example, if the input string is 'ictOS@lab123.com' then the char set should contain {'S', 'a', 'c', 'b', 'o', 'l', 'O', 'i', 't', 'm'}, the digit set should contain {'1','2','3'} and symbol set should contain {'.', '@'}. 3

4C. Write the output of the following:

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>>> import math
>>> from cmath import cos
>>> globals()
```

2

5A. Write a complete Python program which does the following:

i. Implement a class named Point with instance variables x and y, constructor, destructor. Define a set named S in the scope of the class, setters and getters for instance variables.

ii. Implement a subclass of Point, named Pnts, which reads and stores 'n' number of Points. The value of 'n' and Points should be read from user. Define a method named computeS, which should store the constructed 'n' number of Points in S (defined in parent class), provided S should store points such that each point is a tuple of the form x,y. 5

5B. Write a Ruby program to move the array elements into the different arrays based on the data type. Consider all Ruby datatypes. 3

5C. With an example, explain shallow copy and deep copy in Python. 2