Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104

(Constituent College of Manipal University)

FOURTH SEMESTER B.Tech. (CCE) DEGREE END SEMESTER EXAMINATION MAY– 2016
SUBJECT: ADVANCED PROGRAMMING TECHNOLOGIES – ICT 2252
(REVISED CREDIT SYSTEM)

TIME: 3 HOURS **07/05/2016** **MAX. MARKS: 50**

Instructions to candidates

- Answer **ALL** questions.
- Missing data, if any, may be suitably assumed.

1A. Write a Ruby program to read a string from user and perform the following operations:

i. Place every alternate word into a string named "alt". For example, if the input is "This is an example" then the output is "is example"

ii. Reverse each word in a string. For example, if the input is "This is an example" then the output is "sihT si na elpmaxe".

iii. Display all the palindrome words present in the input string.

iv. Copy only the words starting with vowel to a new string named vowel. For example if the input is "This is an example" then output string is "is an example".

v. Each words in the input string should be repeated and stored in a string named "repeat". For example if the input is "This is an example" then output string is "ThisThis isis anan exampleexample"

1B. Write a Python program to display the numbers in the following format.

```
    1
   2 1
  3 2 1
 4 3 2 1
5 4 3 2 1
```

1C. How can caching be achieved using Python? Explain with an example. **[5+3+2]**

2A. Write a Python program to do the following:

i. Read 'n' number of sentences from user. Create a list in the form [['word1','word2','word3',….]['word1','word2','word3',….]]. The first nested list stores the first sentence, second nested list stores the second sentence and so on. For example if the user entered sentences "This is an example", "Second sentence", "Third sentence" then the list would be [['This','is','an','example'],['Second','sentence'],['Third','sentence']…].

ii. Check whether the list is palindrome or not. Example of the list which is a palindrome is ['first','second','third','second','first']

iii. Capitalize each word in the nested list and display.

iv. Convert each of the nested list to sentences and display the sentences.

2B. Write a Python program to do the following:

i. Create two sets by reading its elements from user. Sets are of different sizes.

ii. Perform union, intersection and difference operations on these sets and display the results.

2C. Differentiate between deep copy and shallow copy with an example for each. **[5+3+2]**

3A. Create a Python class 'Shape' in a module named 'shape'. Let the 'Shape' class contain x and ,y as its data members, constructor, destructor and appropriate methods. Derive a class Circle and Rectangle from Shape class. The Circle and Rectangle classes should be in the modules circle and rectangle respectively. The Circle class has radius as its data member, constructor, destructor and

appropriate methods. The Rectangle class has side1 and side2 as its data members, constructor, destructor and appropriate methods. The sub classes should contain methods to find the area. Use class variable and class method to find the total area of all the objects of Circle and Rectangle class.

3B. Write a Python program which accepts a sequence of comma separated 4 digit binary numbers as its input and then check whether they are divisible by 5 or not. The numbers that are divisible by 5 are to be printed in a comma separated sequence.

3C. What is the output of the following error free code? Justify.

```
matrix ={(0,0) : 3, (0,2) : -2, (0,3) : 5, (1,1) :-9, (3,3) : 15}
for r in range(0,4):
    for c in range(0,4):
        e=matrix.get((r,c),0)
        print e
```

4A. Write a complete Python program to do the following: **[5+3+2]**

i. Create a dictionary which stores registration number as key and value as the list, which is of the form [Name, Semester, Section and Department]. Read the details of "N" students from the user and store it in the dictionary.

ii. Read registration number from user and display students details using the dictionary created.

iii. Display all the student details where the student name contains the word "Gupta".

iv. Read the semester from the user and display students who belong to the same semester.

v. Display department wise student details.

4B. What is the output of the following Ruby code-snippet:

```
a=["one","two","three","four","five"]
h={1=>'one',2=>'two',3=>'three',4=>'four',5=>'five'}
a.each{|i| print i,' '}; puts
h.each{|i,j| print i,' ',j,' '}
r=a.collect{|i| i+i}
print "\n",r,"\n"
4.times{ |i| print i,"\t" }; puts
10.upto(18){|i|  print i,"\t"}; puts
6.step(12,2) { |i|  print i,"\t"}
```

4C. Write a Python program to convert a decimal number to binary, octal and hexadecimal.

5A. Write a Python program to do the following: **[5+3+2]**

i. Define the calculator function, Calculator which takes three parameters namely, operands, an arithmetic operation (which can be addition, subtraction, multiplication or division and is addition by default) and an output format (which can be integer or floating point, and is floating point by default. Division should be floating-point division).

ii. The calculator function should apply the operation to the first two numbers, and then apply it again to the result and the next number, and so on. For example, if the function is called as Calculator(6, 4, 9, 1, subtraction) then the function should return the value of (6 - 4 - 9 – 1). If only one operand is entered, it should be returned unmodified. If no operands are entered, it should display an error message.

iii. Write the results of the following calls:

a. Calculator(2,3,56, integer)

b. Calculator(1.6,2.8,3,7,9, multiplication, integer)

5B. Write a Python program using generator to print the prime numbers between 0 and n in comma separated form.

5C. Explain the Ruby functions used to convert a string to integer and a string to float with suitable examples for each.

[5+3+2]