[Total No. of Questions - 9] [Total No. of Printed Pages - 3]

DEC-23-1243

MCA-6105 (Python Programming)

MCA-1st CBCS/NEP

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note: The candidates are required to attempt one question each from Section (A, B, C, D) and all questions from section E.

SECTION A

1. Deficient number is a number whose proper divisors add up to less than itself. For example, 16 is a deficient number as sum of its proper divisors {1, 2, 4, 8} = 15. Print the sum of all deficient number between x and y. x and y are the user inputs and 1 <x< y. (12)

OR

2. Ask the user to input a number N. Create a two-dimensional list L of numbers of size N*N. Define a function named "Check_diagonal_Prime" which takes the two-dimensional list L as the argument and prints True if the sum of its principal diagonal elements is prime otherwise prints False.

   Testcase: IF N= 3 then suppose L = [[12, 2,4], [3,4,3], [1,5,7]]. The principal diagonal elements are 12, 4 and 7. The sum is 23. As 23 is a prime number, so the output will be True. (12)

SECTION B

3. Explain how object oriented programming is better than procedure oriented programming. Write a Python program to create a class representing a shopping cart. Include methods for adding and removing items, and calculating the total price. (12)

OR

4. Write a python program to open a file named myfile.txt in read mode. Check whether the content of the file follows the rules given below. (12)

   Rules:

   - The first letter of each line must be capital.
   - There must not be two white spaces between words.

   Display the total number of errors (deviating from the rules) present in the file. Write the content of the file to a new file named correct.txt after making all the corrections if any.

SECTION C

5. What is exceptional handling? Explain the difference between error and exception. Write a Python program that executes an operation on a list and handles an Index Error exception if the index is out of range. (12)

OR

6. Write a Python program to create a table named student with the following columns id, name, marks, city. Insert four records in that table. Ask the user to enter the id and update that students city column to "Delhi". Finally select all rows from the table and display the records. (12)

SECTION D

7. Ask the users to enter the receivers mail id and the text message. Use python SMTP module to compose a mail to the recipients mail id. (12)

OR

8. Write a NumPy program to create a 3×4 matrix. Transpose the matrix and iterate over it. Multiply the original matrix with the transposed matrix and display the result. (12)

SECTION E

9. a. What is the difference between list and tuple?

   b. What do you mean by typecasting? Give an example.

   c. How to access the elements of a dictionary?

   d. Explain the keyword self in python.

   e. What is operator overloading? Give an example.

   f. What are the different modes of opening a file using python?

(6×2=12)