Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 90277

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

First Semester

Civil Engineering

GE 8151 – PROBLEM SOLVING AND PYTHON PROGRAMMING

(Common to all Branches)

(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions.

PART – A **(10×2=20 Marks)**

1. How will you analyse the efficiency of an algorithm ?
2. What is the use of Algorithm, Flowchart and Pseudo code in the perspective of problem solving ?
3. Compare interpreter and compiler. What type of translator is used for Python ?
4. Write a python program to print sum of cubes of the values of n variables.
5. Do Loop statements have else clause ? When will it be executed ?
6. Write a program to display a set of strings using range() function.
7. How will you update list items ? Give one example.
8. Can functions return tuples ? If yes give example
9. How to use command line arguments in python ?
10. Write methods to rename and delete files.

PART – B **(5×16=80 Marks)**

11. a) i) What is a Programming Language ? What are its types ? Explain them in detail with their advantages and disadvantages. **(8)**

ii) Write a function find_index(), which returns the index of a number in the Fibonacci sequence, if the number is an element of this sequence and returns-1 if the number is not contained in it, call this function using user input and display the result **(8)**

(OR)

b) i) What is recursive function ? What are its advantages and disadvantages ? Compare it with iterative function. **(6)**

ii) Implement a recursive function in Python for the sieve of Eratosthenes. The sieve of Eratosthenes is a simple algorithm for finding all prime numbers up to a specified integer. It was created by the ancient Greek mathematician Eratosthenes. The algorithm to find all the prime numbers less than or equal to a given integer n: **(10)**

1) Create a list of integers from two to n: 2, 3, 4,...., n.

2) Start with a counter i set to 2, i.e. the first prime number.

3) Starting from i + i, count up by i and remove those numbers from the list, i.e. 2*i, 3*i, 4*i,...

4) Find the first number of the list following i. This is the next prime number.

5) Set i to the number found in the previous step.

6) Repeat steps 3 and 4 until i is greater than n. (As an improvement: It's enough to go to the square root of n)

7) All the numbers, which are still in the list, are prime numbers.

12. a) i) Write a python program to rotate a list by right n times with and without slicing technique. **(4+4)**

ii) Discuss about keyword arguments and default arguments in python with example. **(4+4)**

(OR)

b) i) Write a python program print the maximum among 'n' randomly generate 'd' numbers by storing them in a list. **(10)**

ii) Evaluate the following expressions in python. **(6)**

i) 24//6%3

ii) float(4+int(2.39)%2)

iii) 2**2**3

13. a) i) If you are given three sticks, you may or may not be able to arrange them in a triangle. For example, if one of the sticks is 12 inches long and the other two are one inch long, you will not be able to get the short sticks to meet in the middle. For any three lengths, there is a simple test to see if it is possible to form a triangle: If any of the three lengths is greater than the sum of the other two, then you cannot form a triangle. Otherwise, you can.

i) Write a function named is – triangle that takes three integers as arguments, and that prints either "Yes" or "No", depending on whether you can or cannot form a triangle from sticks with the given lengths. **(4)**

ii) Write a function that prompts the user to input three stick lengths, converts them to integers, and uses is_triangle to check whether sticks with the given lengths can form a triangle. **(4)**

ii) Write a python program to generate all permutations of a given string using built-in function. **(8)**

(OR)

b) i) Compare lists and array with example. Can list be considered as an array ? Justify. **(6)**

ii) Write a python function are Anagram1 () to check whether two strings are anagram of each other or not with built-in string function and are Anagram2() to check the anagram without using built-in string function. **(10)**

14. a) i) Define Dictionary in Python. Do the following operations on dictionaries. **(10)**

i) Initialize two dictionaries with key and value pairs.

ii) Compare the two dictionaries with master key list and print missing keys.

iii) Find keys that are in first and not in second dictionary.

iv) Find same keys in two dictionaries.

v) Merge two dictionaries and create a new dictionary using a single expression.

ii) What is list comprehension in python ? Explain with example. **(6)**

(OR)

b) i) What is tuple in python ? How does it differ from list ? (8)

ii) Write a python program to sort n numbers using mergesort. (8)

15. a) i) What are exceptions ? Explain the method to handle them with example. (8)

ii) Write a python program to count the number of words in a text file. (8)

(OR)

b) i) How to Merge multiple files in to a new file using python. (6)

ii) What are modules in python ? How will you import them ? Explain the concept by creating and importing a module. (10)