

Data Structure Using Python (313306)

MSBTE Diploma · K-Scheme · Model Question Paper — Set A

Time: 3 Hours**Max. Marks: 70****Instructions:**

1. All questions are compulsory.
2. Answer each next main question on a new page.
3. Illustrate your answers with neat sketches wherever necessary.
4. Figures to the right indicate full marks.
5. Assume suitable data, if necessary.
6. Mobile phone, pager and any other electronic communication devices are not permissible in the examination hall.

Q.1 Attempt any FIVE of the following:**10**

- a) List any four features of Python.
- b) Define linear and non-linear data structure. Give one example of each.
- c) State any two basic tuple operations with example.
- d) Define: i) Data abstraction ii) Data encapsulation
- e) List any four types of inheritance in Python.
- f) Define the following terms w.r.t. tree: i) Leaf node ii) Degree of a node
- g) Write the syntax to import a module with a new name (renaming a module).

Q.2 Attempt any THREE of the following:**12**

- a) Describe any four built-in functions in Python with example.
- b) Differentiate between list and array. (Any four points)
- c) Construct a binary search tree for the following elements: 52, 30, 75, 18, 41, 66, 90, 35, 70
- d) Explain membership and identity operators in Python with example.

Q.3 Attempt any THREE of the following:**12**

- a) Write a Python program to reverse a given number and check whether it is a palindrome (take input from user).
- b) Explain how to create a set and how to access, update and delete values in a set.
- c) Describe doubly linked list with a neat diagram and example.
- d) Develop a Python program to implement linear search.

Q.4 Attempt any THREE of the following:**12**

- a) Describe any four functions of NumPy with suitable example.

- b) For the binary tree shown in Fig. 1, write the inorder, preorder and postorder traversal.

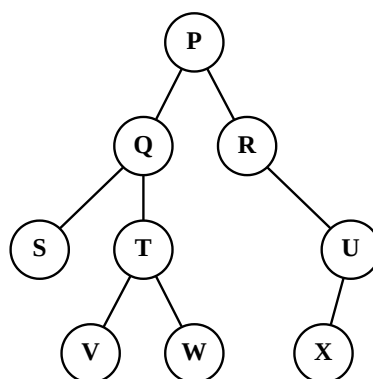


Fig. 1

- c) Develop a Python program for single inheritance.
 d) Convert the following infix expression into postfix form using stack. Show each step: $A + B * (C - D) / E$
 e) Explain break, continue and pass statements with example.

Q.5 Attempt any TWO of the following:

12

- a) Write a Python program to implement bubble sort. Show the list after each pass for: 47, 12, 85, 30, 6, 59
 b) Write a Python program to create a user-defined module for arithmetic operations (addition, subtraction, multiplication, division) and use it in another program.
 c) Distinguish between Breadth First Search and Depth First Search. Write BFS and DFS of the graph in Fig. 2 starting from vertex 1.

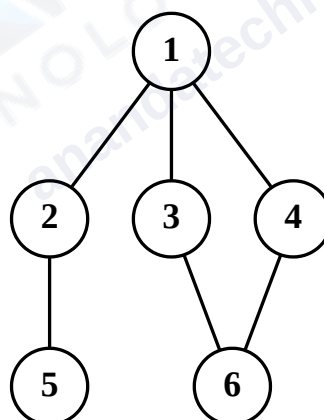


Fig. 2

Q.6 Attempt any TWO of the following:

12

- a) Write a Python program to implement method overloading and method overriding.
 b) Explain dictionary in Python. Write a program to create, access, update and delete elements of a dictionary.

- c) Write a Python program to accept n numbers from the user in a list and find the largest number, smallest number and sum of all numbers.

Note: This is a **model question paper prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in

