

Data Structure Using Python (313306)

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

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 the types of operators in Python.
- b) Compare global and local variables. (Any two points)
- c) Define: i) Stack ii) Queue
- d) Define spanning tree. State any two properties of spanning tree.
- e) Write an algorithm for inorder traversal of a binary tree.
- f) Define object oriented programming. List any two of its features.
- g) State any two differences between list and tuple.

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

- a) Explain if-elif-else statement and for loop in Python with example.
- b) Differentiate between data abstraction and data encapsulation.
- c) Write the steps to create a Python package with suitable example.
- d) Create a binary search tree for the following values: 47, 21, 76, 18, 33, 52, 89, 27, 60. Write its inorder traversal.

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

- a) Enlist and explain any four features of Python.
- b) Write a Python program to implement selection sort.
- c) Describe any four operations on tuple with example.
- d) Write a Python program to implement a linear queue using list with insert and delete operations.

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

- a) Write a Python program to find the sum of digits of a given number (take input from user).

- b) Explain creating and initialising arrays using standard NumPy methods.
- c) Write a Python program to create class Rectangle with data members length and breadth, and methods to read the data and print area and perimeter.
- d) List any four applications of trees.
- e) Write a Python program to create a dictionary of programming languages and perform add, update and delete operations on it.

Q.5 Attempt any TWO of the following:

12

- a) Develop a Python program to implement single and multilevel inheritance.
- b) Implement a program for importing a module for multiplication and division of two numbers. Use both *import* and *from ... import ... as* forms.
- c) Explain how to convert an infix expression into postfix using stack with the example: $(P + Q) * R - S / T \wedge U$

Q.6 Attempt any TWO of the following:

12

- a) Explain the following with diagram and example: i) Singly linked list ii) Doubly linked list
- b) Write a Python program to perform union, intersection, difference and symmetric difference on sets, and also add, update and delete values in a set.
- c) Explain binary tree traversal algorithms (inorder, preorder, postorder). apply them on the tree in Fig. 1.

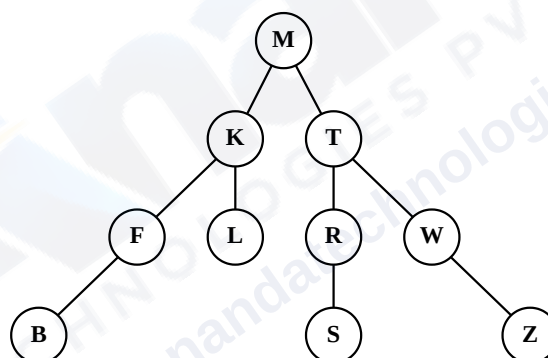


Fig. 1

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