Data Structure Using Python (313306)

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

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) State the use of walrus operator (:=) with example.

b) Define dictionary in Python with example.

c) Define: i) Class ii) Object

d) Define: i) Tree ii) Graph

e) State any two differences between module and package.

f) Write an algorithm for preorder traversal of a binary tree.

g) State any two types of sorting techniques.

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

a) Enlist data types in Python. Describe any two with example.

b) Write a Python program to create user-defined functions for addition, subtraction, multiplication and division of two numbers.

c) Describe the concept of data hiding in Python with example.

d) Construct a binary search tree for: 38, 14, 56, 8, 23, 45, 82, 70, 50. Write its preorder and postorder traversal.

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

a) State and explain relational operators in Python.

b) Write a Python program to print the following pattern:

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

c) Explain any four tree terminologies with example.

d) Write a Python program for recursive binary search.

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

a) Differentiate between binary search and linear search. (Any four points)

b) Write the output of the following code:

```
T = ("red", "Green", "BLUE", "yellow", "Pink")
print(T[1])
print(T[-1])
print(T[1:4])
print(T[::-2])
print(len(T), T.index("BLUE"))
print(list(T[:2]))
```

c) Explain module with respect to: i) Create module ii) Import module iii) Import object from module

d) Explain method overloading in Python with example.

e) Write a Python program to implement stack using list with PUSH, POP and display operations.

Q.5 Attempt any TWO of the following: **12**

a) Write a Python program to implement multiple inheritance.

b) Define array. Write a Python program to create a two-dimensional array of integers and access the values at given index.

c) Convert the following infix expressions into prefix form: i) A + B * C − D / E ii) (P − Q / R) * (S / T − U)

Q.6 Attempt any TWO of the following: **12**

a) Define the following terms with one example of each in Python: identifiers, keywords, indentation, variables, comments, tuples.

b) Write a Python program to create a singly linked list, append nodes and display it. Draw the list.

c) Explain BFS and DFS algorithms with example of the graph in Fig. 1 (start vertex A).

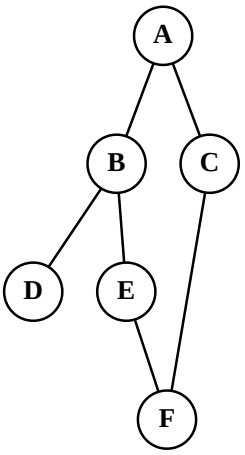

Fig. 1

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