

Roll No.

OLE-97670
BCA 3rd Semester (New)
Examination – April, 2021

DATA STRUCTURE - I

Paper : BCA-202

Time : Three Hours]

[Maximum Marks : 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Questions Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the *compulsory* question there will be *four* units i.e. Unit-I to Unit-IV. Questions Number 1 will be *compulsory*. In addition question, student will have to attempt *four* more questions selecting *one* question from each Unit.

1. (i) What is the difference between data type and data structure ? 8 x 2 = 16
- (ii) Explain overflow and underflow conditions of a stack with examples.

- (iii) Define an algorithm. Write the characteristic of an algorithm.
- (iv) Define the tree and write the properties of a tree.
- (v) What is a data structure ? What is the need of data structures ?
- (vi) What is a non primitive data structure ? Give an example.
- (vii) Differentiate between linear and non-linear data structures.
- (viii) How do you push and pop elements in a stack.

UNIT – I

- 2. (i) Differentiate between linear and non-linear data structure. Explain with the help of example. 8
- (ii) Explain the big-Oh notation with the help of examples. 8
- 3. Explain the following basic terminologies associated with the data structures : 16
 - (i) Data element
 - (ii) Primitive data types
 - (iii) Constant

(iv) Variable

(v) Data object

UNIT – II

4. (i) What is doubly ended queue ? 8
- (ii) What is a circular linked list ? What are its advantages over linear linked list ? 8
5. (i) Explain any *two* array operation with an example. 6
- (ii) Explain about the singly linked list. 4
- (iii) Write the procedure for inserting a node in the linked list at given position. 6

UNIT – III

6. (i) Explain overflow and underflow conditions of a stack with examples. 8
- (ii) What is a circular linked list ? What are its advantages over linear linked list ? 8
7. (i) Write a program to implement a stack (LIFO) using singly linked list. 8
- (ii) What is a tree ? Discuss why definition of tree is recursive. Why it is said to be non-linear ? 8

UNIT – IV

8. (i) What do you mean by Preorder traversal of a tree? 8
- (ii) Describe binary search trees and its applications. 8
9. (i) Explain various methods of representing graphs in memory by giving suitable example. 8
- (ii) Explain binary tree with the help of examples. Discuss the properties of binary tree that need to be considered. 8
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