

Code No: 133AG

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, April/May - 2018

DATA STRUCTURES THROUGH C++

(Common to CSE, IT)

Time: 3 Hours

Max. Marks: 75

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

**PART- A**

(25 Marks)

- 1.a) What is an array? Explain array types. [2]
- b) Differentiate linear and non-linear data structures. [3]
- c) What is queue ADT? [2]
- d) Discuss about double linked list. [3]
- e) Define a max heap. [2]
- f) What is hash function? [3]
- g) Differentiate between trees and binary trees. [2]
- h) Compare insertion sort and selection sort. [3]
- i) What is directed graph? [2]
- j) What are the applications of graphs? [3]

**PART-B**

(50 Marks)

2. What is Constructor? Explain various types of constructors with an examples. [10]

**OR**

3. Discuss in detail about asymptotic notations with an examples. [10]

- 4.a) Discuss about linked implementation of stack ADT.
- b) What are the various applications of stacks? Explain infix to postfix conversion. [5+5]

**OR**

- 5.a) Define and explain about circularly linked list and it's operations with an examples.
- b) Discuss about sparse matrices. [5+5]

- 6.a) What is a priority queue? Explain its applications.
- b) Explain the array representation of a threaded binary tree. [5+5]

**OR**

7. Explain in detail about binary tree traversal and its various traversal techniques. [10]

- 8.a) Differentiate between binary search and linear search.
- b) Explain in detail about linear probing and quadratic probing. [5+5]

**OR**

- 9.a) Explain about heap sorting technique with an example.
- b) Compare various sorting techniques. [5+5]

- 10.a) What is graph? Explain types with examples.
- b) Explain in detail about graph ADT. [5+5]

**OR**

11. Explain the following.  
a) Depth-First-search method    b) AVL tree properties. [5+5]