Code No: 133AG **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, May/June - 2019
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)	Define inheritance and polymorphism.	[2]
b)	Describe omega and theta notations.	[3]
c)	Write the motivation of sparse matrices.	[2]
d)	Explain the ADT of stack.	[3]
e)	What is a binary tree?	[2]
f)	Explain about the ADT of priority queues.	[3]
g)	Define hash function.	[2]
h)	Explain about time complexity of merge sort.	[3]
i)	What is a binary search tree?	[2]
j)	Give an example of DFS.	[3]

PART-B

(50 Marks)

2.a)	Explain constructors and destructors with examples.	
b)	Write about linear data structures with examples.	[5+5]
	OR	
3.a)	Explain about throwing an exception.	
b)	What is recursion? Explain about data abstraction.	[5+5]
4.a)	Explain array representation of stack.	
b)	Describe circular lists and header nodes.	[5+5]
	OR	
5.a)	Discuss in detail about ADT of queue.	
b)	Briefly explain about applications of stack.	[5+5]
6.a)	Explain about Insertion and deletion operations in max heap.	
b)	What are properties of binary trees? Explain.	[5+5]
	OR	
7.a)	Discuss about the ADT BinaryTree.	
b)	What is a threaded binary tree? Explain.	[5+5]
8.a)	Write C++ program for heap sort technique.	
b)	Give comparison of searching methods.	[5+5]
	OR	
9.a)	Write C++ program for insertion sort technique.	
b)	Analyze the time complexity of quick sort technique.	[5+5]

10. Explain the following:
    a) Applications of graphs
    b) Red-black tress. [5+5]

OR

11. Explain the following:
    a) Adjacency matrix
    b) Insertion into an AVL search tree. [5+5]

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