Code No: 123BP **R15**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, May/June - 2019
DATA STRUCTURES
(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) Explain the properties of an algorithm. [2]
b) Distinguish between linear and non linear data structures. [3]
c) What are the disadvantages of queue which is implemented using array and how to overcome it. [2]
d) Write a program to check whether a given string is palindrome or not using stack. [3]
e) Explain the tree traversals with an example. [2]
f) Write a function in C to insert an element into a binary search tree. [3]
g) Explain hash collision. [2]
h) Distinguish between Insertion sort and Selection sort. [3]
i) Explain the properties of B-tree. [2]
j) Write a function of rotations of AVL tree. [3]

PART – B

(50 Marks)

2.a) Write a function to count the number of nodes in a singly linked list.
b) What are the advantages and disadvantages of representing a stack or queue by a linked list? [5+5]

OR

3.a) Write a function to concatenates two circular singly linked lists.
b) Explain the Asymptotic notations with an example. [5+5]

4.a) Write a program to convert infix expression to postfix expression.
b) Explain the applications of circular queue. [5+5]

OR

5.a) Explain the operations of Dequeue with an example.
b) Write an algorithm to reverse a string using stack. [5+5]

6.a) Explain the different techniques used to represent a graph in computer memory.
b) Write a function to delete an element from the Heap. [5+5]

OR

7.a) Construct the binary tree of the following data
25, 30, 10, 9, 62, 5, 18, 43, 53
b) Explain the Graph traversals with an example. [5+5]

8.a) Explain how the choice of pivot element affects the running time of quick sort algorithm.

b) Insert the following elements into the hash table by using Quadratic probing (size of the hash table 10) 30, 45, 28, 65, 26, 77, 40, 11 [5+5]

OR

9.a) Sort the following list of elements by using Heapsort
35, 48, 20, 80, 22, 36, 100,5,15

b) Write a program to implement the binary search. [5+5]

10.a) Construct the Red-Black tree of the following data
40, 25, 10, 60, 55, 70, 100,15,28

b) Write an algorithm of KMP. [5+5]

OR

11.a) Write an algorithm to delete an element from the binary search tree

b) Construct the B-Tree of order 4 of the following data
20, 30, 40, 15,18, 16, 50, 25, 9, 17, 10 [5+5]

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