

Code No: 123BP

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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