

**Code No: 123BP****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech II Year I Semester Examinations, September - 2021****DATA STRUCTURES****(Common to CSE, IT)****Time: 3 hours****Max. Marks: 75****Answer any five questions****All questions carry equal marks**

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1. What is a Doubly-Linked List? What are the operations performed on it and write methods for each operation. [15]
2. Illustrate the stack operations in C using an array and explain the same for implementing recursive procedures. [15]
3. What is a Binary Tree? Explain Binary Tree Traversals. [15]
4. Write an algorithm for Quick Sort and explain with an illustrative example. [15]
5. What are Red-Black Tree? How to construct and insert elements in a Red-Black Tree? Show each step of the Red-Black Tree, built from a sequence of insertions corresponding to the following keys: 44,17,32,78,50,54,62,48,88. [15]
6. Write the algorithms for deletion of an element and insertion of elements in a Circular Linked List and explain the procedure of the same. [15]
- 7.a) What is a Double ended Queue? State various operations on Circular Queues.  
b) Convert to postfix and evaluate the following expression using a stack:  $2+3*4+6/2$ . [7+8]
8. What is a Graph? How is it represented? Explain different Graph Traversals. [15]

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