**R15**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**B.Tech II Year I Semester Examinations, March - 2022**
**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.a)  Explain the concept of asymptotic notations, indicating the normally used notations.
  b)  List out any two applications of linked list and two advantages of doubly linked lists over singly linked list.                                                                   [8+7]

2.a)  Explain the insertion and deletion operations in doubly lined list.
  b)  What are the properties of sparse matrix?                                           [12+3]

3.a)  With an example, explain the operations performed on stacks.
  b)  What are the applications of stack?                                                  [10+5]

4.a)  Explain various operations that are performed on queue with suitable algorithms.
  b)  Explain about Deque.                                                                 [10+5]

5.a)  Construct the binary tree whose following traversals are given:
      inorder : DFEIHBAJCNOMK
      postorder: FIHEDBJONMKCA
  b)  Give the difference between tree and graph.                                          [11+4]

6.a)  Define Max-heap. Write Max-Heapify algorithm that maintain max-heap property.
  b)  Explain about threaded binary tree.                                                  [10+5]

7.a)  Construct the open hash table and closed hash table for the input: 30, 20, 56, 75, 31, 19 using the hash function h(k)= k mod 11.
  b)  Explain about insertion sort with an example.                                        [9+6]

8.a)  Discuss Knuth Morries Pratt (KMP) algorithm. Compute whether the pattern P=10100111 is present in the string T=1001010100111 or not.
  b)  Discuss about splay trees.                                                          [10+5]

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