

**Code No: 123BP****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech II Year I Semester Examinations, October - 2020****DATA STRUCTURES****(Common to CSE, IT)****Time: 2 hours****Max. Marks: 75****Answer any five questions****All questions carry equal marks**

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- 1.a) Distinguish between circular linked list and doubly linked list by giving one example for each.
- b) Write a C function for deleting an integer element from the singly linked list of integer elements. Assume that the singly linked list of integers is already created. [7+8]
- 2.a) Write a C function for inserting an integer element into a circular queue of integers. Assume array representation for the circular queue.
- b) Convert the following infix expression into postfix form  $a+b*c-e/f$ . [8+7]
3. Write a non recursive procedure for the inorder and post order traversal of a binary tree. Assume that the binary tree of elements is already created. [15]
- 4.a) Write heap sort algorithm for sorting a list of integers in ascending order.
- b) What is the time complexity of heap sort in the worst case? [8+7]
- 5.a) Compare the performance of AVL tree with binary search tree.
- b) Write the Knuth-Morris-Pratt pattern matching algorithm. [8+7]
- 6.a) Explain with an example any one method used for representing sparse matrix.
- b) Write a C function for concatenating two singly linked linear lists of characters. Assume that the two singly linked lists of characters are already created. [7+8]
7. Write a C program to implement stack using singly linked list. [15]
- 8.a) Explain with an example the adjacency matrix representation of a graph also mention its complexities.
- b) Write a recursive procedure for the DFS of a graph. [8+7]

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