TCS-303/TIT-303   1075/1076

Odd Semester Examination 2018-19

B.TECH. (SEMESTER-III)

DATA STRUCTURE

Time: 03:00 Hours   **Max Marks : 100**

                                                               [5×4=20]

1. Attempt **any four**:

   (a) What is the data structure? Differentiate between data type and data structures.

   (b) Convert the infix (a+b)*(c+d)/f into postfix & prefix expression

   (c) Define Doubly Linked List. Write a program to print out the elements of a singly linked list.

   (d) Write a program to evaluate a postfix expression.

   (e) Explain the procedure to insert a new node in the (a) Beginning (b) End of the list

2. Attempt **any four** :   [5×4=20]

   (a) Explain the following algorithm of a circular linked list. (a) inset the node at the beginning(b) delete a node from beginning

   (b) What do you mean by Array? Describe the storage structure of Array. Also Explain Various types of Array in detail.

   (c) Draw a Binary search tree for the following input list 60, 25, 75, 15, 50, 66, 33, 44. Trace the algorithm to delete the nodes 25,75,44 from the tree.

   (d) Construct an expression tree for the input ab+cde+**.

   (e) What are Circular Queue and Priority Queue? Write an algorithm to insert and delete an element from a Circular Queue.

3. Attempt **any four** : [10×2=20]

(a) Explain Inorder, Preorder and Postorder Traversal operation on Binary tree with example. Construct a tree for the given inorder and postorder traversals. Inorder : DGBAHEICF Postorder : GDBHIEFCA

(b) State different File Organizations and discuss the advantages and disadvantages of each of them. Write a short note on indexed file organization.

(c) Convert following Infix expression into Postfix expression using Tabular method.
   $a - b / c * d + e * f / g$

4. Attempt **any four**: [10×2=20]

(a) Write and test a program that performs the operation Insert, DeleteMin, Build Heap, Findmin, DecreaseKey, Delete, and IncreaseKey in a binary Heap

(b) Given input { 4371,1323,6173,4199,4344,9679,1989} and a hash function h(X) = X(mod10). Show the resulting 1.Separate chaining table 2.Open addressing hash table using linear probing 3.Open addressing hash table using Quadratic probing 4.Open addressing hash table with second hash function h2(X)=7-(X mod 7)

(c) Explain Different types of Hash Function with example. Explain Radix Sort with the help of example.

5. Attempt **any four** : [10×2=20]

(a) Write an algorithm for inserting and deleting element in an doubly linked list. Explain linear linked list implementation of stack and queue.

(b) What do you mean by balanced trees? What are the categories of AVL rotations? What do you mean by balance factor of a node in AVL tree?

(c) What do you mean by separate chaining? Write the advantage and disadvantage of separate chaining. What do you mean by open addressing?

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