

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 131652

Roll No.

B.TECH.

Theory Examination (Semester-VI) 2015-16

DATA STRUCTURE

Time : 3 Hours

Max. Marks : 100

Section-A

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)

- (a) What is algorithm complexity? What is the need of measuring the complexity of an algorithm?
- (b) Differentiate between primitive data type, abstract data type, and polymorphic data type?
- (c) What is a Stack? Is Stack a linear or non linear data structure?
- (d) How Peek() operation differs from pop() operation?
- (e) What is the advantage of a header node in a linked list?
- (f) Explain the term D-queue?
- (g) What are the limitations of direct address tables?

- (h) Translate this expression into postfix notation and then evaluate it.
- (i) Why an operation to check queue overflow is not implemented on linked queue?
- (j) What is a thread? How is it useful?

Section-B

2. Attempt any five questions from this section. (10×5=50)

- (a) Write a c program to perform the following operations on doubly linked list using functions
 - i. Creation
 - ii. Insertion at the end
 - iii. To remove all duplicate elements
 - iv. Display.
- (b) (i) Translate the following infix expression Q into Postfix expression P using STACK.
- (ii) What is Recursion? What are the basic requirements for Recursion? Write a program to display first four multiple of a number using Recursion.
- (c) Draw the AVL tree for the following sequence of insertion.

14,10,17,12,11,20,18,25,8,22,23 ,66,50

- (d) A binary tree T has 9 nodes. The inorder and preorder traversals of T yield the following sequence of nodes

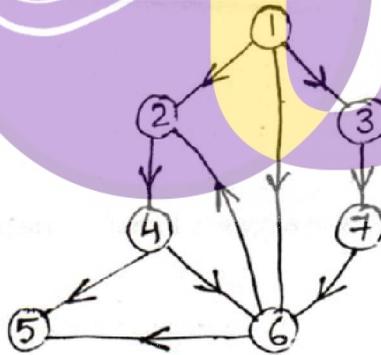
Inorder: E A C K F H D B G

Preorder: F A E K C D H G B

Draw the tree T, State it's height and list internal and external nodes.

- (e) What is index? What are the various types of indexing? State the advantages of using indexing over a sequential file.

- (f) For the following Graph find (i) BFS Traversal. (ii) DFS Traversal



- (g) Compare any three sorting technique with respect to algorithm complexity. Give an algorithm for QUICK sort technique for EVEN number of elements in the series.

- (h) Insert the following keys in the order given below to build them into an AVL tree.

g, h, s, l, e, m, t, u

Clearly mention different rotations used and balance factor of each node.

Section-C

Attempt any two questions from this section. (15×2=30)

3. (a) Write an Algorithm to implement the push, pop and display option of the stack.
- (b) Write an algorithm to evaluate a postfix expression given as a string of characters using stack.
4. (a) Give the advantages of using linked list over array.
- (b) Write the structures of a node for linked implementation of a polynomial. Write a function in C to create a linked list for a polynomial.
5. (a) Write an algorithm for the insertion and deletion in an CIRCULAR QUEUE.
- (b) Differentiate between the B+ tree index files and B tree index files with example.