53 (IT 304) DTST

2018

DATA STRUCTURE

Paper : IT 304 (Back)

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer ***any five*** *questions.*

1. *(a)* Write the differences between stack and queue with example. 4

   (b) Write an algorithm to convert an infix expression to its postfix form using stack. 8

   (c) Convert $A\$B*C-D+E/F/(G+H)$ into its postfix form using stack. 8

2. *(a)* Write the recursive function in C for the Towers of Hanoi problem. 10

(b) Draw the recursive tree of Tower of Hanoi. 10

3. *(a)* Write a function to insert a node in a single linked list. 10

(b) Write a function in C for reversing the elements of a linked list. 10

4. *(a)* Construct a binary tree from pre-order and in-order traversal 10

Pre-order : *A B D I E J C F G K*

In-order : *D I B E J A F C K G*

(b) Write a function to insert a node in a binary search tree. 10

5. *(a)* Insert the following keys in order given to build them into an AVL tree :

a z b y c x d w e v

10

(b) Construct a B-tree of order 3 with the following data : 10

50, 40, 60, 30, 70, 20, 80, 10, 90, 9, 99

6. *(a)* Write an algorithm for Merge Sort. 10

(b) Show how the merge sort algorithm will sort the following array in increasing order : 10

100, 90, 80, 70, 60, 50, 40, 30, 20

7. *(a)* Sort the following elements using bubble sort : 10

30 10 70 20 50 60 80 40

(b) Explain adjacency matrix and adjacency list with an example of a Graph. 10