

Roll No. \_\_\_\_\_

Total Pages : 2

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BT-3/D05

**DATA STRUCTURES**

(Common with CO, IT) (2004-05)

PAPER - CSE-203E

Time : 3 Hrs.

Maximum Marks : 100

Note : Attempt any five questions.

1. a. Explain, what is data structures and its applications ? 5  
b. Discuss in detail "Stack". Also write the Algorithm and program in C language for PUSH and POP operations. 15
2. a. Differentiate Structure and Union with example. 5  
b. Write a C Program to find the Transpose of a Matrix. 7  
c. Convert the following from infix to postfix. Also explain all the steps :-  
(i)  $* A / B * C + D * E - A * C$   
(ii)  $(A + B) * D + E / (F + A * D) + C$  8
3. a. Discuss the advantages and disadvantages of linked list over the array. 5  
b. Explain doubly linked list. Also write the Algorithm for Insertion of a node at various places in doubly linked list. 15
4. Write Algorithms to insert, delete and search an element in a Circular Queue Implemented using linked list. 20
5. a. Draw a Tree, whose Pre-order and In-order traversals are given below :

Pre-order : A B D E G H I C F

In-order : D B G E I H A F C

(3th sem. Electronic+ Math/Eco.)

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- b. Write the functions for following Binary Tree Traversals:  
(i) In-order  
(ii) Pre-order  
(iii) Post-order
6. a. Define the terms :  
(i) Degree of a tree  
(ii) Height of a tree  
(iii) External and Internal Nodes 1+2+2
- b. Write short notes on :  
(i) AVL tree  
(ii) B<sup>+</sup> Tree  
(iii) Binary Search tree 5 x 3 = 15
7. a. Explain minimum- spanning tree. What are its uses ? 5  
b. Define Graph. Write BFS Traversals algorithm for traversing a graph and also explain it with an example. 15
8. a. What is hash function ? When are the perfect hashing function feasible ? 5  
b. Explain the heap sort technique by taking the list :  
8 15 7 6 24 16 20 30 14 35 15

(3th sem. Electronic+ Math/Eco.)

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