

END TERM EXAMINATION

THIRD SEMESTER [B.TECH.]– DECEMBER 2008

Paper Code:ETCS211

Subject: Data Structure

Paper ID: 27211

(Batch: 2004-2007)

Time : 3 Hours

Maximum Marks :75

Note: Q.No.1 is compulsory. Attempt one question from each unit.

- Q.1 (a) Define big 'O' notation. How is it used for representing time and space complexity? (3)
- (b) What are the advantages and disadvantages of array? (3)
- (c) Define Heap and give its applications. (3)
- (d) Give the prefix and postfix form of following infix expressions. (4)
- (i) $A * B + C * D / E - F$ (ii) $A * (B + C) * D / (E - F)$
- (e) What is External Sorting? Why do we require it? (3)
- (f) Which type of linked list is best suited for implementation of queue and why? (3)
- (g) What is indexing? (3)
- (h) Define B tree. (3)

UNIT-I

- Q.2 How sparse polynomial are represented using arrays? Give algorithm for addition of two sparse polynomial represented using array. (12.5)

OR

- Q.3 (a) Write function for insertion and deletion of an element into a stack represented using linked list. (6)
- (b) Write function for insertion and deletion of an element into a circular queue implemented using array. (6.5)

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UNIT-II

- Q.4 (a) Define Binary Tree. Prove that maximum number of nodes in a binary tree of height h can be $2^h - 1$. (6)
- (b) Explain Floyd Warshall's Algorithm for finding all pair shortest path. (6.5)
- OR**
- Q.5 (a) Give recursive function for Inorder, Pre order and Post order traversal of a binary tree. (6)
- (b) Explain Dijkstra's algorithm for finding out single source shortest path. (6.5)

UNIT-III

- Q.6 (a) Discuss algorithm for deletion of a node from a binary search tree. (6.5)
- (b) Discuss Radix Sort method. (6)
- OR**
- Q.7 (a) Define AVL tree. Construct an AVL tree when numbers are inserted as given below. 14, 10, 6, 4, 25, 28, 17, 19, 18, 16. (6.5)
- (b) Explain Merge Sort method. (6)

UNIT-IV

- Q.8 Explain various types of file organizations like sequential, random, hashed, inverted, etc. (12.5)
- OR**
- Q.9 Explain various types of indexing techniques like hashed indexing, tree indexing, cylinder surface indexing, tree indexing, etc. (12.5)