

1058  
B.E. (Information Technology)  
Fourth Semester  
IT-421: Data Structure and Algorithms  
(May 2013)

Time allowed: 3 Hours

Max. Marks: 50

*NOTE: Attempt five questions in all, selecting atleast two questions from each Part.*

x-x-x

**Part A**

1. a). What is the data structure? List various data structures?  
b). Name the different categories of algorithms based on Big Oh notation? What are the limitations of Big Oh Notation?  
(5,5)
2. a). Define time space trade off among algorithms?  
b). Write an algorithm to remove all duplicate elements from a linear array?  
(5,5)
3. a). Convert following arithmetic infix notation to postfix notation and then evaluate it by showing the status of the stack?  
 $16/(11-7)+6*(7+12)-11$   
(10)
4. a). Show the iterative implementation of quick sort method for the following list: 23, 45, 12, 3, 4, 87, 56, 23, 78.  
b). Define priority queue? In what possible ways priority list can be implemented in memory?  
(5,5)

**Part B**

5. a). For a binary search tree, its in-order and pre-order traversals are as follows:  
Pre-order: A, B, E, H, Q, R, C, D, K, L, M  
In-order: B, Q, R, H, E, A, D, L, K, M, C  
What is the Height of the tree? What is its post order traversal?  
b). The sequence 70, 15, 50, 5, 12, 35, 10 represents a max heap. Show the heap after the deletion from root?  
(5,5)
6. a). How Breadth first search differs from depth first search? Can we perform these searches on weighted graphs? Justify your answer?  
b). Illustrate the working of merge sort method for the following array  
33, 26, 35, 29, 18, 10, 24  
(5,5)
7. Sort the given list in ascending order using selection sort method?  
34, 54, 12, 4, 78, 23, 15, 56, 46  
(10)
8. a). What are collisions in hashing? How collisions can be handled?  
b). What is linear probing and Quadratic probing?  
(5,5)

x-x-x