

Roll Number:

Thapar University Patiala

Department of Computer Science & Engineering

ME-Com Sc & Inf Sec (1st Semester) MST Sep 2012

PCS-101: Advanced Data structures

Time: 02 Hours; MM: 20

Name of Faculty: Deepak Garg

Note: All Questions are compulsory.

| | | |
|---|---|-------|
| 1 | <p>a) Compare Deletion, Insertion and Access Complexity in Array and Link List.</p> <p>b) What will be your criteria to select a data structure for a given problem?</p> <p>c) What you mean by adaptive sorting. Explain with example.</p> <p>d) Discuss with example deletion in a Binary search tree when node to be deleted has two children.</p> <p>e) Explain Independent set concept in a graph. Take an example to illustrate your point.</p> | 1*5 |
| 2 | <p>a) Merge sort is an divide and conquer algorithm. Differentiate between in-place and out-of place merge sort and write the algorithm for any one of these.</p> <p>b) What is skip list data structure? Discuss how insertion takes place in skip list.</p> | 2.5*2 |
| 3 | <p>a) Write an efficient program/algorithm for the following Implement a stack using an array. Stack consists of n elements. Now convert the stack into a queue which should be implemented using a link list. Elements will be popped from the stack and enqueue in the queue. in the end Queue will have all the n elements and stack will be empty. Write clear and structured program/algorithm.</p> | 5 |
| 4 | <p>a) Write algorithm for recursive implementation of Breadth First search algorithm for a graph and explain with the help of an example.</p> <p>b) We are having three lists of arrays. Develop an algorithm to check if we can take one element from each of the three lists and it sums upto zero. It should be an $O(n^2)$ algorithm. Explain how you calculated the complexity of your algorithm.</p> | 2.5*2 |