

Total No. of Page(s): 3

Roll No. 308/09/10

FOURTH SEMESTER

B.E. (COE)

B.E. END SEM. EXAMINATION, May/June 2012

COE-213: Data Structures

Time: 3:00 Hrs.

Max. Marks: 70

Note: Question No.1 is compulsory. Attempt any four questions from the rest. Assume any missing data suitable.

1. [a] Define the following with example:

- (i.) Data Structure
- (ii.) Connected Component
- (iii.) Abstract Data Type
- (iv.) Searching
- (v.) Array
- (vi.) Expression Tree
- (vii.) Height Balance Tree
- (viii.) Depth First Search Traversal
- (ix.) Threaded Binary Tree
- (x.) Recursion

(10)

[b] Differentiate between general tree and binary tree.

(3)

(c) What is stack? What are the various applications of stack?

(3)

[d] What do you mean by graph? Explain the principle behind the Dijkstra's algorithm.

[3]

[e] What do you understand by binary tree traversal? Write the algorithm for preorder traversal.

[3]

2. [a] Write an algorithm/function ReverseQueue that takes as a parameter a stack and a queue whose elements are of the same type. The ReverseQueue uses the stack to reverse the elements of the queue.

(7)

[b] Write an algorithm NodeCount that count the number of nodes in a binary tree.

(5)

3. [a] Assume the following list of keys:

28, 18, 21, 10, 30, 12, 71, 32, 58, 15, 92, 36, 73, 11

This list is to be sorted using quick sort algorithm. Use pivot as the middle element of the list. Show all the steps.

23/05/2013 13:19

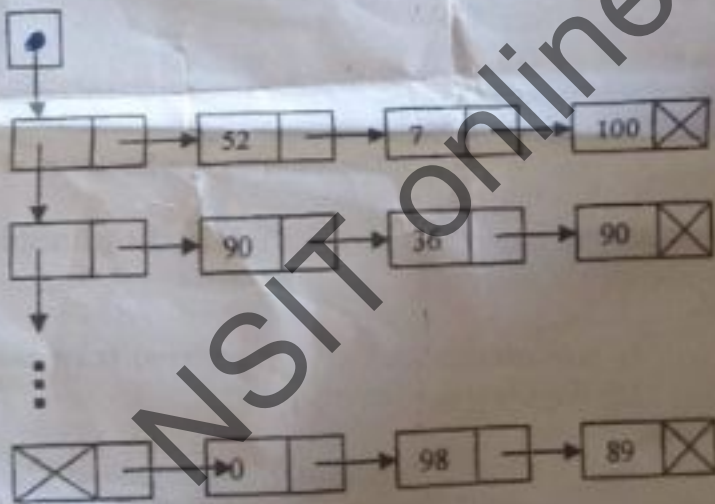
6) What is hashing? How collision resolved in hashing? Give a numerical example to show that collision resolution by chaining is better than probing. [7]

4. [a] Write an algorithm PrintListReverse that uses a stack to print a linked list in reverse order. [6]

[b] Write and explain Kruskal's algorithm with suitable example. [6]

5. [a] Suppose in a programming language single dimensional array is declared like this a [l..u]. l is the lower limit and u is the upper limit. If a binary tree stored in this array, what would be the formula for finding the index of left child, right child and parent of node which is stored at a[i]. [5]

[b] Write an algorithm that creates a two dimensional linked list. The nodes in the first column contain only two pointer as shown below. The left pointer points to the next row. The right pointer points to the data in the row. [7]



6. [a] Formulate an algorithm to subtract two polynomials in three variables. The terms are ordered lexicographically. [6]

[b] Formulate an algorithm which will delete a node from an AVL tree and leave the resulting tree balanced. (Hint If the node is not leaf, find its inorder predecessor to see if it can be deleted) [6]

23/05/2013 13:20