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B.E./B.Tech. (Full-Time) DEGREE END SEMESTER EXAMINATIONS
NOV/ DEC 2013
ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH

Fifth Semester
EE 9305 - Data Structures and Algorithms
[Regulation 2008]

Time: 3 Hrs.

Max. Marks: 100

Answer ALL Questions

PART - A [10 x 2 = 20]

1. Give the pseudocode for the two important operations in a stack.
2. What are the two methods available for deleting an element in an unordered list implemented using arrays? Which one is efficient?
3. Differentiate between normal and binary trees.
4. What is the minimum and maximum number of elements in a heap of height h ?
5. State the reason for the improved performance of shell sort.
6. When a rooted binary tree becomes heap?
7. List the basic steps in divide and conquer technique.
8. What are the problems that can be solved using backtracking technique?
9. How graphs are implemented using adjacency matrix?
10. Compare and contrast Kruskal's and Prim's algorithms.

PART - B [5 x 16 = 80]

11. i) Explain the concept of greedy algorithm with respect to minimum spanning tree problem. [8]
 ii) How merge sort is carried out using divide and conquer technique. [8]
12. a) i) Give the algorithm to evaluate an arithmetic expression in postfix notation using a stack and also find the value of the expression $A B C * D / +$ with $A = 2, B = 3, C = 4$ and $D = 6$. [8]
 ii) Define ADT, Explain the concept of List ADT with the possible operations, Show how it is implemented using cursor. [8]
 Or
 b) Explain the implementation of lists using pointers (singly linked list). List all possible operations on them. Illustrate them using simple code and diagrams. [16]
13. a) Explain the concept of AVL Trees with all the possible rotations for restoring balance. Show how the values 14, 17, 11, 7, 53, 4, 13 are inserted into an empty AVL tree one by one followed by the deletions of 53 and 11. [16]
 Or
 b) List and explain the different binary tree traversal techniques available with appropriate pseudocode and diagrams. [16]
14. a) Give the quick sort algorithm. Build the initial heap for the array [42, 83, 21, 90, 55, 93, 81, 97, 37, 73]. [16]
 Or
 b) Write down the heap sort algorithm with heapify procedure. Illustrate the operation of quick sort on the array $A = [42, 83, 21, 90, 55, 93, 81, 97, 37, 73, 84, 83]$. [16]

P.T.O.

15. a] i) Explain the working of Dijkstra's Algorithm with a simple example. [10]
ii) How all pairs of shortest paths are found? [6]

Or

- B] i) State the basic idea behind BFS and DFS. [4]
ii) Explain the working of BFS along with the data structures used in detail. [12]

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