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B.E./B.Tech. (Full-Time) DEGREE END SEMESTER EXAMINATIONS
(April 2014)
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. Define Abstract Data Types.
2. Give the pseudocode for push and pop operations in a stack.
3. Differentiate between normal and binary trees.
4. How an in-order traversal of a binary tree is performed?
5. What is the basic step involved in a bubble sort?
6. When a rooted binary tree becomes heap?
7. List the basic steps in Divide and Conquer technique.
8. What do you mean by Greedy algorithm?
9. What is the purpose of color in DFS algorithm?
10. How graphs are implemented using adjacency lists?

PART - B [5 x 16 = 80]

11. Write a detailed note on divide-and-conquer approach and greedy technique in algorithm design with examples. [16]

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] i) How a normal queue is implemented using an array? State the problems encountered in the same. [8]

ii) With diagrams explain the concept and implementation of Circular Queue. [8]

13. a] i) Give algorithms for different tree traversal techniques on a binary tree. [8]

ii) Construct a complete binary tree with two levels after the root; name the nodes with alphabets in level order and perform the possible tree traversals in it. [8]

Or

b] 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]

P.T.O.

14. a] i) Give the Bubble Sort and Insertion Sort algorithms. Show how Bubble sort algorithm sorts the array [42, 83, 21, 90, 55, 93, 81, 97, 37, 73]. [16]

Or

b] i) Give the heap sort algorithm. [8]

ii) Carryout heap sort for the heap with elements 27, 9, 14, 8, 5, 11, 7, 2 and 3 (elements are in level order). [8]

15. a] Write down Floyd's algorithm that can also find out the path, Dijkstra's algorithm and compare them. [16]

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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