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08SCS12

First Semester M.Tech. Degree Examination, June/July 2011
Data Structures and Algorithms

Time: 3 hrs.

Max. Marks:100

Note: *Answer any FIVE full questions.*

1   a.   What is an algorithm? Explain asymptotic notations, used to represent the time complexity. **(06 Marks)**

    b.   What are abstract data types? Represent the vectors and doubly linked list with all the operating in C++. **(14 Marks)**

2   a.   What in binary search tree? Write C++ code to find minimum and maximum value entered in the BS tree. **(10 Marks)**

    b.   What is an AVL tree? List the properties of the AVL tree. **(06 Marks)**

    c.   Construct an AVL tree for the list 5, 6, 8, 3, 2, 4, 7. **(04 Marks)**

3   a.   Write C++ code to represent a simple hash function. **(06 Marks)**

    b.   What is separate chaining? Explain. **(06 Marks)**

    c.   What is an extendible hashing? Explain with an example. **(08 Marks)**

4   a.   What is a binary heap? Explain its properties. **(05 Marks)**

    b.   With an example, explain insert and delete operation on binary heap. **(10 Marks)**

    c.   How d-heaps differ from leftist heaps. **(05 Marks)**

5   a.   Write and analyze the insertion sort algorithms. **(06 Marks)**

    b.   Write C++ code quick sort and analyze its complexity for all possible cases. **(14 Marks)**

6   a.   Explain topological sorting with an example. **(06 Marks)**

    b.   What is minimum spanning tree? Write pseudo code for Kruskal's algorithm, with an example. **(10 Marks)**

    c.   Write any two applications for depth first search. **(04 Marks)**

7   a.   Write a note on greedy algorithm. **(06 Marks)**

    b.   What is dynamic programming? Write pseudocode for all pairs shortest path. **(08 Marks)**

    c.   Write a note on optimal binary search tree. **(06 Marks)**

8   Write short notes on the following :

    a.   B – tree.

    b.   Merge sort.

    c.   Network flow problems.

    d.   Divide and conquer. **(20 Marks)**

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