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05SCS12

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

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Briefly explain the implementation of arrays and structures with suitable example. **(10 Marks)**

b. Explain the implementation methods of a class, with an example **(10 Marks)**

2 a. Explain an algorithm for inserting to and deleting from a queue while detecting overflow and underflow conditions. **(10 Marks)**

b. Using stack, develop a program to convert an infix expression to postfix form, with an example. **(10 Marks)**

3 a. Explain how does a linked list differ from other data structure. What are the advantages and disadvantages of linked list? **(10 Marks)**

b. Implement the routines for inserting and deleting a node after a given node in a given linked list. **(10 Marks)**

4 a. What is binary tree? Explain the tree traversal, with suitable example. **(10 Marks)**

b. What is chaining? Develop the function for searching and inserting a node with chaining, when the hash collision occurs. **(10 Marks)**

5 a. Analyze algorithms and state the criteria while designing it. **(10 Marks)**

b. List the important aspects of good hashing function. Also explain in brief, the different hash function employed. **(10 Marks)**

6 a. What are the main features of greedy strategy method and demonstrate the same with an knapsack application. **(10 Marks)**

b. Briefly explain the method :
   i) Branch and bound
   ii) Back tracking. **(10 Marks)**

7 a. What is the role of stack in quick sort? Write the algorithm for quick sort and trace the algorithm to sort the following numbers 41, 79, 65, 35, 21, 48, 59, 87, 52, 28. **(12 Marks)**

b. Develop an algorithm to sort the set of elements using merge sort. **(08 Marks)**

8 Write short notes on :
a. Priority queues
b. Bubble sort
c. Doubly linked list
d. 8 – Queen's problem. **(20 Marks)**