Roll No .....

# MCSE/MSE - 102

## M.E./M. Tech., I Semester

Examination, June 2014

## Advanced Data Structure and Algorithm

*Time : Three Hours*



*Max. Marks : 70*

***Note:*** Total number of questions 8. Attempt five questions (including all parts). Assume missing data, if any suitably.

1. a) Explain time and space complexity related to algorithms and also state their importance. 7
   b) Distinguish between static memory allocation and dynamic memory allocation. Also explain how to implementation them. 7

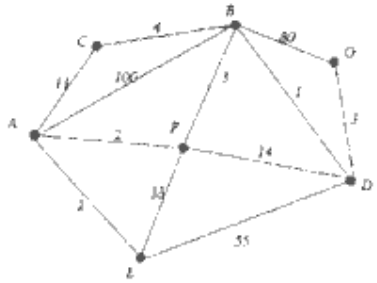
2. a) How sets can be represented by trees? Represent union and find operations by taking suitable example. Also write weighting rule for union of two trees with roots i and j. 7
   b) What do you understand by doubly linked list? Write a function that removes all duplicate elements from a list. 7

3. a) Write an algorithm to delete the node with identifier X from an AVL tree T. The resulting tree should be reconstructed if necessary. Show that the time required for this is o(log n) when there are n nodes in T. 7
   b) Find an optimal merge pattern for 11 files whose lengths are: 12, 5, 84, 5, 3, 9, 35, 3, 11. Write and explain the algorithm used and determining. It's complexity. 7





4. a) Find Minimum cost spanning tree for the given graph. 7




   b) Write an algorithm to evaluate the postfix expression and evaluate the following postfix expression - 7
   7 6 + 4 * 4 10 - ^ 5 +.

5. a) What is dynamic programming method of algorithm design? Differentiate it with the greedy method. 7
   b) Explain the following terms: 7
      i) DFS ii) Adjacency Matrices
      iii) Spanning tree iv) Connected component

6. a) Discuss the boundary tag method to allocate and free the variable size nodes. 7
   b) Discuss the basis of the buddy system of allocation. What type of fragmentation still exists? 7

7. a) Explain quick sort. Compare quick sort and merge sort in terms of their complexity. 7
   b) What is hashing? Explain in detail open addressing technique to resolve hash clashes. 7

8. Explain the following: 14
   i) Parallel computing
   ii) Virtual Hashing
   iii) Divide and Conquer

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