Roll No ....

CS/IT - 305
B.E. III Semester
Examination, December 2015
CS - 305 : Data Structure
IT - 305 : Data Structure and Algorithm
Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each questions are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Define sparse matrics.
   b) What is garbage collection.
   c) Discuss tower of Hanoi problem.
   d) Let X[11][8] be stored in column major order and X[2][2] be stored at 1024 and X[3][3] at 1084. Find the address of X[5][3] and X[1][1].

   OR

   Write a program in C to search and display the position of an element in one dimensional array.

Unit - II

2. a) Define multiqueue.
   b) Discuss the dynamic representation of linked list.
   c) Discuss the comparison between stacks and queues.
   d) Write an algorithm for evaluation of postfix expression with example.

   OR

   Discuss the algorithm for insertion at a specified position in the linked list.

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Unit - III

3. a) What is Huffman coding algorithm?
   b) What are application of trees?
   c) Define extended binary trees.
   d) Construct the AVL tree for the following set of elements 13, 5, 1, 7, 8, 98, 67, 26, 33, 12, 6, 7, 8.

   OR

   Construct the B-tree of order 5 for the list of elements given as follows.
   1, 7, 6, 2, 11, 4, 8, 13, 12, 5, 19, 9, 18, 24, 5, 12, 14, 20, 21.

Unit - IV

4. a) Define symbol table .
   b) Discuss internal and external sorting.
   c) What are the collision resolution strategies?
   d) Discuss the algorithm of quick sort with example.
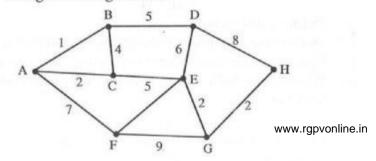
   OR

   Search the element 39 in the following list using binary search.
   16, 18, 24, 35, 37, 39, 43, 63, 80, 88 and also write the algorithm of binary search.

Unit - V

5. a) Define spanning tree.
   b) Define weakly connected graph.
   c) Discuss the representation of graph in computer.
   d) Discuss breadth first search algorithm with example.

   OR

   Find the minimum spanning tree for the following graph using Prim's algorithm.

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