Reg.No. : ☐☐☐☐☐☐☐☐☐☐

B.E./B.Tech. (Full-Time) DEGREE END SEMESTER EXAMINATIONS
(Nov. / Dec. 2011)
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 'Stack' and give any two applications of it.
2.   What is the advantage of using a dynamic queue?
3.   Give the property of a binary-search-tree.
4.   Derive the expression for finding the height of a full tree of order d and size n.
5.   Give the reason for improved performance of shell sort.
6.   What is the minimum and maximum number of elements in a heap of height h?
7.   Give the steps involved in divide and conquer methodology.
8.   State the problems encountered and their solutions in DFS.
9.   Write the procedure to print the shortest path in Floyd's algorithm.
10.   How the values of A matrix are calculated during k^{th} iteration?

PART - B [5 x 16 = 80]

11. a] Rewrite operations ENQUEUE and DEQUEUE for a dynamic queue.   [8]
    b] 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]

12. 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] i)   Give procedures that returns a pointer to the minimum and maximum
             elements in a binary search Tree.   [4]
        ii) How insertions and deletions are made in a binary search tree.   [12]

13. a] i)   When a rooted binary tree becomes heap?   [2]
        ii) Give the heap sort algorithm.   [7]
        iii) Carryout heap sort for the heap with elements 27, 9, 14, 8, 5, 11, 7, 2 and 3
             (elements are in level order).   [7]
                                Or
    b] Give the algorithm description for sorting by exchange and shell sort with proper
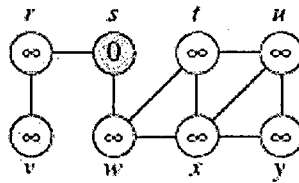   explanations.   [16]

P.T.O.

- 1 -

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

Or

b] Describe backtracking with two examples of your choice. [16]

15. a] Explain the procedure for carrying out BFS in a given graph. Show the operations of BFS on the following undirected graph. [16]

Or

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

-:o0o:-