EASTERN UNIVERSITY ,SRILANKA
EXTERNAL DEGREE EXAMINATION IN SCIENCE
SECOND YEAR FIRST SEMESTER- (2003/2004)
2004/2005(July/August 2008)
XTCS-201 – DATA STRUCTURE AND DESIGN OF ALGORITHM
(Proper and Repeat)

nswer all Questions   **Time: Two Hours**

uestion 01
    Explain the following Data Structures.
        i)   Array;
        ii)   Linked list;
        iii)   Stack;
        iv)   Queue;
        v)   Graph;
        vi)   Tree.

Question 02
    Write short notes on the following:
        i)Design of Algorithm;
        ii)Properties of Algorithm;
        iii)Analysis of Algorithms;
        iv) Asymptotic notations;
        v) Recursion.

Question 03
    a) Given an array : 89, 20, 31, 56, 20.
        Explain the Sorting of this array in ascending order using
        (i) Bubble Sort;
        (ii)Insertion Sort.
    b) i) Comment on the efficiency of linear search and binary search in relation to the
            number of elements in the list being searched.

       ii) Write an algorithm which finds the locations and values of the largest and second
            largest element in a two dimensional array DATA with N rows and M columns.

Question 04
        Each node of a STACK contains the following information, in addition to
        required pointer field :
        (i) Roll number of the student.   ii)Age of the student.
        Give the structure of node for the linked stack in question.
        TOP is a pointer pointing to the topmost node of the STACK.
        Write the following functions :
        (i)   PUSH( ) – To push a node in to the stack which is allocated dynamically.
        (ii)   POP( ) – To remove a node from the stack and release the memory.