00311

B.Tech. IN COMPUTER SCIENCE & ENGINEERING (BTCSVI)

Term-End Examination

December, 2012

BICS-007 : DATA STRUCTURES

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt **any five** questions. Each question carries **equal** marks. Answer must be given in **English** language only.*

1. (a) Consider the 25x4 matrix array ABC.   8
         Suppose base (ABC)=200 and there are
         W=4 words per memory cell. Calculate the
         address of ABC [12, 3] using row-major
         order and column major order.

    (b) Explain Stack Push and Pop operations.   6
         Write down the algorithm for push and pop
         operations for a stack implemented using
         an array.

2. (a) Explain Sparse Matrix with example. What   7
         are the advantages of sparse matrix ?

    (b) Explain Prefix, Infix and Postfix notations   7
         with example. Convert the following infix
         expression into prefix form -
         (A+B)* C/D

3. (a) Consider the algebric expression 8
E=(a-b)/((c*d)+e). Draw the Binary tree T
which corresponds to the expression E. Also
give the pre order traversal of the tree.

(b) Write 'C' function to insert and delete a node 6
from a circular queue.

4. (a) Write an algorithm for Breadth First Search 7
(BFS) traversal of a graph.

(b) Write the algorithm for Bubble Sort. What 7
is worst case complexity of bubble sort?

5. (a) Sort the following data using selection sort. 7

77, 33, 44, 11, 88, 22, 66, 55.

(b) Write the algorithm for binary search. What 7
is worst case complexity of binary search ?

6. (a) What are the advantages of linked list over 7
arrays ? Write an Algorithm to insert a node
at the beginning of a singly linked list.

(b) Explain doubly linked list with example. 7
Write the procedure to insert a node at the
end of a doubly linked list.

7. Write short notes on *any two* of the following : **2x7=14**

   (a) Merge sort.

   (b) Algorithm complexity and time-space trade-off.

   (c) Generalized linked list

   (d) Garbage collection

   (e) Hashing.

   ———