00245

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

Term-End Examination

June, 2012

BICS-007 : DATA STRUCTURES

Time : 3 Hours *Maximum Marks : 70*

Note : *Attempt **any five** questions. All questions carry **equal** marks. Answer must be in English language only.*

1. (a) What do you mean by Algorithm complexity ? What is time - space trade off ? 6

   (b) Explain Multidimensional Arrays. Also explain row-major order and column major order with formula and specific example. 8

2. (a) Convert the following infix arithmetic expression into post fix form and show stack status after every step - 7

   $(A+B)*C/D+E\uparrow F/G$

   (b) What do you mean by Linked list ? Write down the algorithm for insertion at the beginning of a singly linked list. 7

3. (a) Explain Queues with example. Write down the algorithm for insertion and deletion in queue using circular array. 7

(b) The Inorder and Post order traversal of binary tree yield the following sequence of nodes : 7

In order : D B F E A G C L J H K

Post order :D F E B G L J K H C A

Draw the binary tree

4. (a) Explain Insertion sort with example. Write the algorithm for Insertion sort with its complexity. 7

(b) Sort the following data using Quick Sort. 7

44, 33, 11, 55, 77, 90, 40, 60, 99, 22, 88, 66

5. (a) Explain Binary Search. Write the algorithm for Binary Search and also find its complexity. 7

(b) Write an algorithm for Depth First Search (DFS) traversal of a graph. 7

6. (a) Write a function in C to perform push and pop operations in a stack implemented using an array. 7

(b) Explain Hashing. Describe the various. hash functions with example. Also explain Collision Resolution. 7

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

(a) Garbage collection and compaction

(b) Spanning Tree and Minimum cost Spanning Tree

(c) Planner Graph. With its applications

(d) Hamiltonian path and circuits

(e) Data structures and its applications