B.Tech. – VIEP – COMPUTER SCIENCE AND ENGINEERING (BTCSVI)

⊓⊔4⊆∃   **Term-End Examination**

December, 2016

BICS-007 : DATA STRUCTURES

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks.*

1. (a)   Explain multidimensional arrays. How can strings be stored using a multidimensional array ?   7

    (b)   Explain the different ways of analysing algorithms.   7

2. (a)   Write an algorithm which converts a given infix expression to a prefix expression.   7

    (b)   Write a 'C' program to implement a stack with all the operations using a linked list.   7

3. (a) Write an algorithm to insert a number in the linked list at the following positions : 7

(i) In the beginning of the list,

(ii) At the end of the list.

(b) Write the algorithms for insertion and deletion operations performed on the circular queue. 7

4. (a) Define a tree. How do you represent the binary tree in the computer's memory ? List the operations that can be performed on a binary tree. 7

(b) If the in-order traversal of a binary tree is B, I, D, A, C, G, E, H, F and its post-order traversal is I, D, B, G, C, H, E, F, A, determine the binary tree. 7

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

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

6. (a) Write a program to sort the elements of an array using bubble sort techniques. 7

(b) Sort the following data using insertion sort techniques : 7

25, 15, 30, 9, 99, 20, 26

7. Write short notes on any *four* of the following : $4 \times 3\frac{1}{2} = 14$

   (a) Hashing

   (b) Planar Graphs and its application

   (c) Spanning Tree

   (d) Storage Pools

   (e) Sparse Matrix

   (f) Time and Space Complexities