

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

**Term-End Examination**

00814

**June, 2017**

**BICS-007 : DATA STRUCTURES**

*Time : 3 hours*

*Maximum Marks : 70*

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

1. (a) Define sparse matrix. Write a function to find the transpose of a sparse matrix. 7
- (b) Differentiate between static tree table and dynamic tree table. 7
2. (a) Write any recursive constructive algorithm to find a Euler path in the Eulerian graph. 7
- (b) Define algorithm. How do you measure the complexity of an algorithm ? List the commonly used asymptotic notations. 7

3. (a) Explain Queues with the help of example. Write down the algorithm for insertion and deletion in a queue using circular array. 7
- (b) The inorder and postorder traversal of a binary tree yield the following sequence of nodes :
- Inorder : DBFEAGCLJHK
- Postorder : DFEBGLJKHCA
- Draw the binary tree. 7
4. (a) Explain the Tower of Hanoi problem with the help of a suitable example. 7
- (b) What is a binary tree ? Draw all the possible binary trees having 3 nodes. 7
5. (a) Explain Multidimensional Arrays. Also explain row major order and column major order with formulae and specific examples. 7
- (b) Define data, information, algorithm and data structure. Give the difference between linear and non-linear data structures. 7
6. (a) Define the dynamic implementation of a linear linked list. 7
- (b) Write a program to implement Bubble Sort. 7

7. (a) Suppose T is a binary tree. Write a recursive procedure which finds the number NUM of nodes in T. 7
- (b) Explain Breadth First Search algorithm. 7
8. Write short notes on any *two* of the following :  $2 \times 7 = 14$
- (a) Comparison of Indexing and Hashing
- (b) Planar Graph with its Applications
- (c) Difference between Dynamic Programming and Divide and Conquer Approach
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