| BICS-007 |

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

Term-End Examination

June, 2019

BICS-007 : DATA STRUCTURES

Time : 3 hours   *Maximum Marks : 70*

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

1. (a) What is a binary tree ? How binary tree is different from binary search tree ? Discuss threaded binary tree with suitable example and give its advantages over binary tree.   7

   (b) If binary tree traversal sequence is given in prefix and postfix order, only. Then, can we reconstruct the original tree ? Justify your answer with suitable arguments and example.   7

2. (a) Explain Multidimensional Arrays. Also explain the row major order and column major order with formulas and specific examples.   7

   (b) What is a Eulerian Graph ? Give salient features of Eulerian Graph. Write an algorithm to find Eulerian path in the Eulerian graph.   7

3. (a) Write Breadth First Search (BFS) algorithm. 7
Explain BFS algorithm with suitable example.

(b) Write C program for Bubble Sort? Calculate 7
the complexity of Bubble Sort algorithm.
Demonstrate the Bubble Sort mechanism by
sorting the data below.

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

4. (a) What is a linked list? Write 'C' function to 7
insert a node in the beginning, in the end
and in between the nodes of a linked list.

(b) What is a Queue? How Queue is different 7
from Stack? Discuss the Stack Overflow
and Stack Underflow Condition with
suitable example. Evaluate the following
postfix expression using stack as underlying
data structure.

109 + 493 / * 3 + −

5. (a) Draw the Binary tree by using the following 7
tree traversal sequence :

Inorder : DBFEAGCLJHK

Postorder : DFEBGLJKHCA

Can we draw the Binary tree if in place of
Inorder traversal sequence the preorder
traversal sequence is given? Justify your
answer.

(b) Briefly discuss the terms "Hamiltonian 7
Graph" and "Hamiltonian Cycle". Give
suitable examples for each.

6. (a) Write algorithm for QuickSort. Demonstrate 7
the QuickSort algorithm by sorting an
Unsorted sequence of your choice. Prove
that best case for Bubble Sort is worst case
for Quick Sort, by calculating the complexity
of Quick Sort in both cases i.e., Best and
Worst.

(b) Discuss the chaining and Re-Hashing 7
technique in Hash table organization. Give
advantages and disadvantages of both
techniques.

7. Write short notes on **any two** of the following :
                                                    2x7=14
(a) Planar graphs and its applications

(b) Mazing problem

(c) Garbage collection

(d) Dynamic true table