007 - Elective-I - Paper-III : Data Structures

P. Pages : 2   GUG/S/23/13134

Time : Three Hours ||||||||||||||||||||||| Max. Marks : 40
                                          * 0 2 8 7 *

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Notes : 1. All questions are compulsory and carry equal marks.
         2. Draw neat and labelled diagrams wherever necessary.
         3. Avoid vague answers and write answers relevant and specific to questions only.

Either :

1. a) Define and classify linear data structures.   **4**

       b) Write an algorithm to transpose of matrix.   **4**

OR

       c) Explain types of arrays in detail.   **4**

       d) Write an algorithm for selection sort sorting technique.   **4**

Either :

2. a) Write an algorithm to insert an element into the stack.   **4**

       b) Translate following postfix and prefix expression into equivalent infix   **4**

           i) $ABD\uparrow+EF-/G+$

           ii) $+A*-*BC*/D\$EFGH$

OR

       c) Explain different terms related to stack.   **4**

       d) Write an algorithm to insert the element in circular queue.   **4**

Either :

3. a) What is tower of Hanoi problem? Write down all the moves involved in moving three disks   **4**
           from source to destination peg. Show all the moves pictorially.

       b) Write an algorithm to traverse a linked list.   **4**

OR

       c) Define recursion and what are the properties of recursive algorithm.   **4**

       d) Write an algorithm to insert new node in a linked list.   **4**

Either :

4. a) Define following terms **4**
  i) Node   ii) Root Node
  iii) Terminal Node   iv) Singleton tree

  b) Write an algorithm for breath-first search. **4**

<div align="center">OR</div>

  c) Define the following terms **4**
  i) Adjacent node   ii) Path
  iii) Degree of node   iv) Isolated node

  d) Given below is the pre-order traversal of binary tree of integer numbers 5,1,2,3,6,7,4,9,8. **4**
  Draw a corresponding tree and determine whether the tree is binary search tree or not.

5. Attempt all the questions.

  a) Explain in short, searching. **2**

  b) What do mean by multiple stacks? **2**

  c) State the applications of Linked list. **2**

  d) What do mean By BST? Explain. **2**

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