C. U. SHAH UNIVERSITY
Summer Examination-2017

Subject Name : Data and File Structure

Subject Code : 4TE03DFS1   **Branch : B.Tech (CE)**

Semester :3   Date : 31/03/2017   Time : 10:30 To 1:30   Marks : 70
Instructions:
    (1) Use of programmable calculator & any other electronic instrument is prohibited.
    (2) Instructions written on main answer book are strictly to be obeyed.
    (3) Draw neat diagrams and figures (if necessary) at right places.
    (4) Assume suitable data if needed.

Q-1   Attempt the following questions: **(14)**
    a)   Define Data Structure.
    b)   Define Algorithm.
    c)   What do you mean by Time Complexity?
    d)   Differentiate Linear and Non-Linear Data Structure.
    e)   Differentiate iteration and recursion.
    f)   Define Array.
    g)   List out applications of Stack.
    h)   Define Deque.
    i)   Differentiate Singly Linked List and Doubly Linked List.
    j)   Define MST.
    k)   Define directed graph.
    l)   Define Symbol table.
    m) Differentiate Sequential File and Random File.
    n)   What is Augmented Data Structure?

Attempt any four questions from Q-2 to Q-8
Q-2   Attempt all questions:
    (a)   Write an algorithm for Linear Search and Binary Search.   **(06)**
    (b)   Sort the following data using Bubble sort and Selection sort methods. (Generate Pass   **(06)**
        wise result)
        45, 55, 5, 25, 35, 15
    (c)   Define: Worst Case and Best Case analysis of algorithm.   **(02)**

Q-3   Attempt all questions:
    (a)   Write an algorithm of PUSH and POP of Stack.   **(06)**
    (b)   Convert the following INFIX Expression to POSTFIX Expression using tabular form: **(06)**
        (a) $(A * B + C) / (D - (E / F) + G)$, (b) $(A \wedge B) - C * (D / E + F)$
   **(c)**   Define: Linear Search and Binary Search.   **(02)**

Q-4 **Attempt all questions:**
  (a) Write an algorithm to convert an INFIX Expression to a POSTFIX Expression. **(06)**
  (b) Construct a binary tree for the following traversals: **(06)**
    Inorder: DGBAHEICF
    Postorder: GDBHIEFCA
    Also find its Preorder traversal.
  (c) Define: Degree of Vertex and Null Graph. **(02)**

Q-5 **Attempt all questions:**
  (a) Write an algorithm to insert an element into and delete from Simple Queue **(06)**
  (b) Explain matrix and linked list representation of a graph. **(06)**
  (c) Define: Strictly Binary Tree and Complete Binary Tree. **(02)**

Q-6 **Attempt all questions:**
  (a) Define AVL Tree. Construct AVL tree for following data: **(06)**
    Sun, Mon, Tue, Wed, Thu, Fri, Sat.
  (b) Explain Threaded Binary Tree with suitable example. **(06)**
  (c) Define: File and Record. **(02)**

Q-7 **Attempt all questions:**
  (a) Write the following algorithms for a Singly linked list. **(08)**
    i) Insert an element at first position
    ii) Delete a specified element
  (b) Explain Graph Traversal techniques with suitable example. **(06)**

Q-8 **Attempt all questions:**
  (a) Find MST using Prim's and Krushkal's Algorithm on following graph: **(08)**
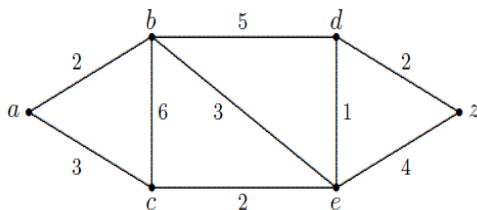
  (b) Write a note on: Collision Resolution Techniques. **(06)**