Time: 3 Hours   **Marks: 80**

N.B: (1) Question No.1 is compulsory
      (2) Attempt any three questions of the remaining five questions
      (3 Figures to the right indicate full marks
      (4) Make suitable assumptions wherever necessary with proper justifications

Q.1 (a) Explain Linear and Non-Linear data structures.   (5)
    (b) Explain Priority Queue with example.   (5)
    (c) Write a program in 'C' to implement Quick sort.   (10)

Q.2 (a) Write a program to implement Circular Linked List. Provide the following
      operations: (10)
        (i) Insert a node .
        (ii) Delete a node
        (iv) Display the list
   (b) Explain Threaded Binary tree in detail   (10)

Q.3 (a) Explain Huffman Encoding with suitable example   (10)
   (b) Write a program in 'C' to check for balanced parenthesis in an expression
     using stack   (10)

Q.4 (a) Write a program in 'C' to implement Queue using array.   (10)
   (b) Explain different cases for deletion of a node in binary search tree. Write function
     for each case   (10)

Q.5 (a) Write a program in 'C' to implement Stack using Linked-List .Perform the following
      operations: (10)
        (i) Push
        (ii) Pop
        (iii) Peek
        (iii) Display the stack contents
   (b) Explain Depth First search (DFS) Traversal with an example. Write the recursive
     function for DFS   (10)

Q.6. Write Short notes on (any two)   (20)
        (a) Application of Linked-List –Polynomial addition
        (b) Collision Handling techniques
        (c) Expression Tree
        (d) Topological Sorting

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