

## Prelim Paper

Time: 3 Hrs.]

## Data Structures

[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

1. (a) Explain different types of data structures with examples. [5]  
(b) Write a C program to implement Quick sort. [5]  
(c) Write a function for DFS traversal of graph. [5]  
(d) Write a C program to convert infix expression into postfix Expression. [5]
2. (a) Write a C program to convert infix expression into postfix Expression. [10]  
(b) Write a function to implement Binary Search on sorted set of Integer. [10]
3. (a) Write a program in C to implement circular queue using arrays. [10]  
(b) Construct AVL Trees using following : [10]  
37, 55, 18, 25, 68, 10, 43, 50, 40, 46, 52, 60
4. (a) Construct huffman code for the symbols of message ACBADACA. [10]  
(b) Write a function to implement singly Linked list following operations : [10]  
(i) Insert a node at specific Location (ii) Delete a node from end  
(iii) Display the list
5. (a) Write a C function for following operations on Double Linked list [10]  
(i) Insert Beginning (ii) Delete Beginning  
(b) Write a C function to perform Deletion operation in Binary Search Tree. [10]
6. **Attempt following (Any 2) :** [20]  
(a) Explain B Tree & B+ Tree.  
(b) Explain :  
(i) Various methods to represent graph in computer memory.  
(ii) Explain different Applications of Linked List.  
(c) Explain a c program to implement Double Ended Queue.

