

**(3 hours)**

**Total marks:80**

Note:

1. Q1 is compulsory
2. Attempt any Three from remaining Five questions

Q.1(a) Differentiate the following 10  
i. Singly linked list and doubly linked list  
ii. Linear queue and circular queue

(b) Given a set of symbols & corresponding frequency table as below explain the steps to find the huffman's code. 10

A	B	C	D	E	F	G	H	I
20	8	7	11	14	6	6	10	9

Q.2(a) Define B-tree and B\* tree. Build a B-tree of order 5 by inserting the data in the sequence 10  
48 33 55 70 65 16 29 98 25 4 18 62 11 72 10

(b) Write a short note on 10  
i. Circular linked list  
ii. Applications of stack

Q.3(a) Define Expression tree? Draw an expression tree for the following expression and also Write it's prefix and postfix traversal. 10  
**(A \* (B - C) + H / (D - E)) / L**

(b) Write an algorithm for binary search of an element. 10  
Consider the list of size 7 with target 50,  
27, 30, 36, 40, 46, 50, 89  
Apply binary search for searching the given the target in above list. Show the tracing of the algorithm.

Q.4(a) Define Binary tree? Explain types of Binary tree. Reconstruct the binary tree using following traversal 10

**Inorder: D B F E A C H G**

**Preorder: A B D E F C G H**

**After construction also write post- order traversal of the binary tree .**

(b) Define doubly linked list. Write algorithms to insert a node and to search a node in doubly linked list with suitable diagrams. 10

Q.5(a) Define Heap .State and explain it's types. Write an algorithm for the following 10  
 I. Reheap\_Up  
 II. Reheap\_Down

(b) Write an algorithm for selection sort. Consider the list of size 7: 10  
 27, 85, 26, 40, 76, 65, 19  
 Apply selection sort to sort above list. Show the tracing of an algorithm.

Q.6(a) Define hashing. Explain any one hashing technique with collision resolution 10  
 technique with example.

(b) Travers the following graph in DFT. Find out Minimum spanning tree using Krushkal's 10  
 algorithm.

