(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   10
find the huffman's code.

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   10
sequence
   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   10
also   Write it's prefix and postfix traversal.
(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   10
following traversal
    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 .
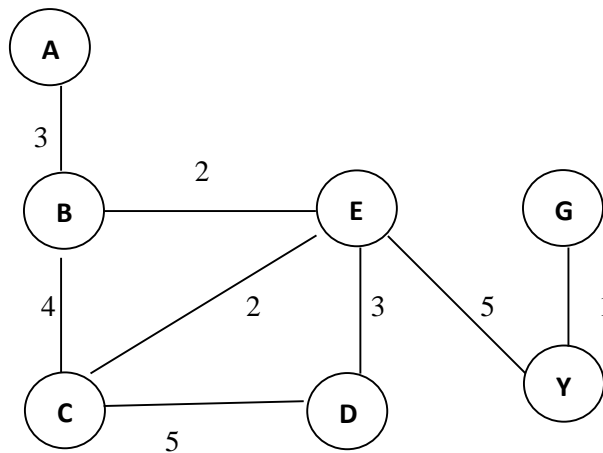
(b)   Define doubly linked list. Write algorithms to insert a node and to search a node in   10
doubly linked list with suitable diagrams.

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.

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