(3 Hours) **[Total Marks: 80]**

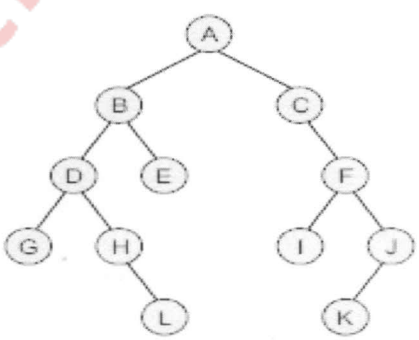
N.B.: (1) Question No.1 is compulsory.

(2) Attempt **any three** out of remaining questions.

(3) Assume Suitable data if necessary.

(4) **Figures** to the **right** indicate full **marks**.

Q1.	(a)	Explain linear and non linear data structures.	2
	(b)	Define a graph. List the types of graph with examples.	3
	(c)	What is expression tree? Give Example.	3
	(d)	Define asymptotic notations with an example	3
	(e)	Define Double Ended queue. List the variants of double ended queue.	3
	(f)	What is Recursion? State its advantages and disadvantages.	3
	(g)	What is linked list? State the advantages of linked list.	3
Q2.	(a)	Write an algorithm for merge sort and comment on its complexity.	10
	(b)	Write an algorithm for implementing stack using array.	10
Q3.	(a)	Define Binary Tree. Find in-order, pre-order and post-order of following binary tree.	10



	(b)	Write an algorithm for implementing Queue using array.	10
Q4.	(a)	Explain Quick sort using an example. Write algorithm for it and comment on its complexity.	10

(b) What is collision? What are the methods to resolve collision? Explain Linear probing with an example. 10

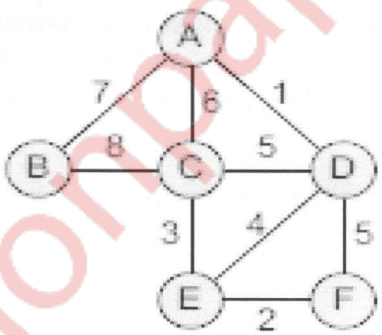
Q5. (a) Write an algorithm for converting infix to postfix expression. 10

(b) Define Binary Search Tree. Write an algorithm for following operations on binary search tree 10
(1)Insertion
(2)Deletion

Q6. (a) Write an algorithm for following operations on Doubly linked List 10
(1)Insertion
(2)Deletion
(3)Traversal

10

(b) What is Minimum Spanning Tree? Draw the MST using kruskal's and prim's algorithm and find out the cost with all intermediate steps.



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