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

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

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

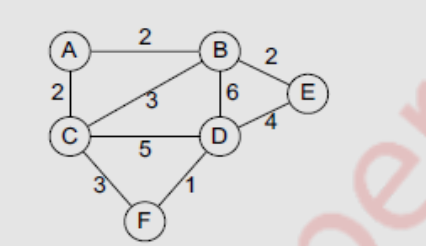
(3) Assume Suitable data if necessary.

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

1.	(a)	Explain different types of queues in data structures.	**3**
	(b)	How does binary search different from linear search?	**3**
	(c)	Explain Doubly Linked List.	**3**
	(d)	Define graph and list any three applications of graph.	**3**
	(e)	Write postfix form of the following infix expression. A+(B*(C-D)/E)	**3**
	(f)	Explain linear and nonlinear data structures.	**2**
	(g)	Write a note on recursion.	**3**
2.	(a)	Explain Binary search tree. Construct Binary search tree for following elements: **45, 39, 56, 12, 34, 78, 32, 10, 89, 54, 67, 81**	**10**
	(b)	What is Singly Linked List? Write an algorithm to implement following operations on Singly linked List. (1)Insertion(All cases) (2)Deletion(All cases) (3)Traversal	**10**
3.	(a)	Write an algorithm for implementing stack using array.	**10**
	(b)	Write an algorithm for merge sort and comment on its complexity.	**10**
4.	(a)	Construct the binary tree for Inorder and Preorder traversal sequence given below Inorder: DBEAFCG Preorder: ABDECFG Write a function to traverse a tree in Postorder sequence.	**10**
	(b)	Write an algorithm for quick sort and comment on its complexity.	**10**

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



6. Write short notes on **(Any 4)** 20

a) Asymptotic notations
b) Double Ended Queue(De-Queue)
c) Insertion Sort
d) DFS and BFS
e) Expression Tree.
