

(3 Hours)

[Total Marks: 80]

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

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

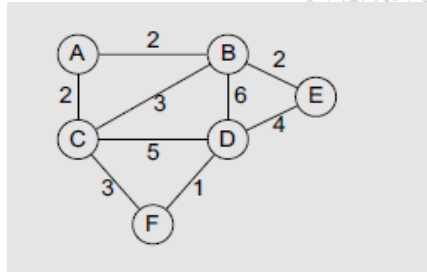
(3) Assume Suitable data if necessary.

(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: **10**
45, 39, 56, 12, 34, 78, 32, 10, 89, 54, 67, 81
 - (b) What is Singly Linked List? Write an algorithm to implement following operations on Singly linked List. **10**
 (1)Insertion(All cases)
 (2)Deletion(All cases)
 (3)Traversal
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 **10**
 Inorder: DBEAFCG
 Preorder: ABDECFG
 Write a function to traverse a tree in Postorder sequence.
 - (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**
- Asymptotic notations
 - Double Ended Queue(De-Queue)
 - Insertion Sort
 - DFS and BFS
 - Expression Tree.