

B.E IT Sem (IT) CRCS

(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. 3

$$A+(B*(C-D)/E)$$
- (f) Explain linear and nonlinear data structures. 2
- (g) Write a note on recursion. 3

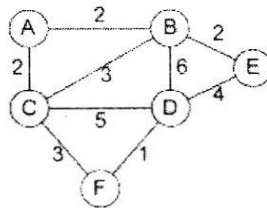
2. (a) Explain Binary search tree. Construct Binary search tree for following elements: 10

$$45, 39, 56, 12, 34, 78, 32, 10, 89, 54, 67, 81$$
- (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**
- a) Asymptotic notations
 - b) Double Ended Queue(De-Queue)
 - c) Insertion Sort
 - d) DFS and BFS
 - e) Expression Tree.
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