



- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.

1. a) Explain Data structure and it's various types. 8
- b) Write a program to check the matrix is sparse matrix or not sparse matrix. 8
(A matrix is sparse if number of zero elements is more than half elements)

OR

2. a) Explain Merge sort with time complexity and implement merge sort for the following elements. 8

24	17	5	11	19	12	4	2
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- b) Explain Binary search. Write a program to implement Binary searching method. 8
3. a) Explain stack with it's PUSH and POP operation. 8
- b) Explain multiple stack and write C code to it's operation's i.e. PUSH and POP. 8

OR

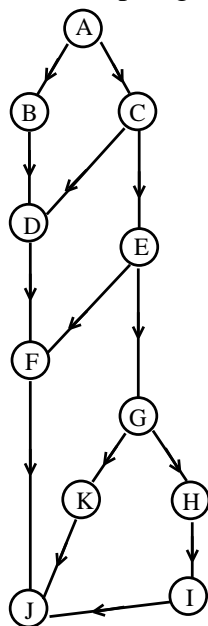
4. a) Explain circular Queue with it's operations. Also write C code for it's operation's. 8
- b) Evaluate postfix operation's given below, using stack. 8
 - i) $3 * (4 + 5) / 2$
 - ii) $(3 + 5) * (4 - 2)$
5. a) Write a C program to count number of nodes in singly Linked list. 8
- b) What is Linked list? Write a C code to implement Queue using linked list. 8

OR

6. a) Write a C function for the following operations for circular singly linked list. 8
 - i) insert-at-beg ()
 - ii) delete_from_end ()
 - iii) display ()
 - iv) delete_from_beg ()
- b) Write a program to implement stack using linked list. 8
7. a) Define and explain with example. 8
 - i) Binary Tree
 - ii) Balance Tree
- b) What are Tree Traversing Techniques? Write algorithm and explain with example. 8

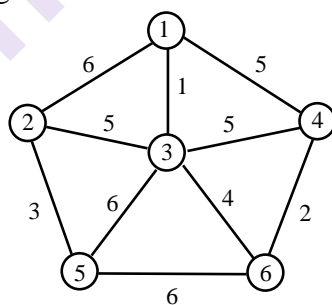
OR

8. a) Explain Binary Search Tree with example. Write algorithm to insertion & deletion in BST. 8
- b) Write a note on 8
- i) Threaded Binary Tree ii) AVL Tree
9. a) Define & explain with example. 8
- i) Adjacency Matrix ii) Adjacency List
- b) Write a note on Topological sort. Find sorting sequence for given graph. 8



OR

10. a) Explain Minimum cost spanning Tree. Show that cost of following graph is 15. 8



- b) Explain traversing in Graph. 8
- For the given graph, draw the DFS & BFS?

