



- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Assume suitable data whenever necessary.
 9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain Data structures with its types. 8
- b) Explain characteristics of Algorithm with suitable example. 6

OR

2. a) Explain top down and Bottom up approach of programming. 7
Explain merge sort algorithm and its complexity.
- b) Explain Asymptotic Notations and analysis of algorithms. 7
3. a) Explain stacks write a men driven program for implementing stack as an array. Write following functions in the program. 6
i) Push
ii) Pop
iii) Traverse
- b) Connect the following infix expression into postfix using stack. 7
 $A + (B * C - (D / E) * G) * H.$

OR

4. a) Explain insertion and deletion in a circular queue. Also write 'C' functions for the following in circular queue: - 7
i) Insertion
ii) Deletion
iii) Traverse
- b) Write short note on: 6
i) Priority Queues
ii) Applications of stack.
5. a) Write a C program for creating a singly linked list on n nodes. Also explain memory representation of a singly linked list. 7

b) Explain sparse Matrix with suitable example.

6

OR

6. a) Explain with suitable example generalized linked list.

6

b) Write a C program to insert a new node in a doubly linked list at a given position.

7

7. a) Write a short note on nonlinear data structures. Define binary tree and representation of binary tree.

6

b) Draw a BST for the following nodes. Also explain procedure for searching a particular node in a BST.

7

Nodes = {36, 28, 14, 3, 10, 97, 76, 83, 44, 53, 18}

OR

8. a) Write short note on the following.

6

i) Threaded Binary Tree.

7

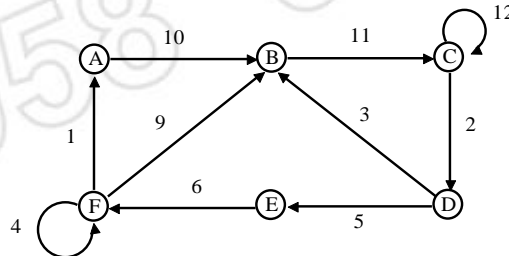
ii) AVL tree

9. a) Explain Prim's & Kruskal's algorithms for creating spanning trees with example.

7

b) Draw adjacency Matrix, adjacency list and weight Matrix for the following graph.

6



OR

10. a) Explain tree traversal algorithms with suitable example.

7

b) Explain Dijkstra's algorithm for finding shortest path.

6

11. a) Explain Binary search. Write C program to search an element using linear search.

7

b) Write short note on Hashing Techniques.

7

OR

12. a) Sort the following array using.

3

i) Bubble sort

ii) Merge sort.

3

iii) Quick sort.

4

iv) Min Heap sort.

4

Array : - 36, 59, 24, 86, 73, 12, 15, 69, 33.
