

Time: 3 hours

Marks: 80

- N.B 1) Question no. 1 is compulsory
2) Attempt any three out of remaining question

- Q.1 a) What is ADT? Write ADT for Stack. 3
b) Explain Asymptotic notations 3
c) Draw all possible Binary Search Trees of 7,9,11 3
d) Define Minimum spanning tree with example 3
e) Write an algorithm to count the number of nodes in singly linked list. 3
f) Explain with example 3
i. Degree of a tree
ii. Height of a tree
g) Define algorithm and state its properties 2
- Q.2 a) Write a program for insertion in singly linked list. 10
b) Write an algorithm to implement stack as a array. 10
- Q.3 a) Write a program for infix to postfix conversion 10
b) Write properties of Heap. Also build Max-Heap from given data: 56 , 12, 45, 33, 8, 63, 74, 25, 18, 36 10
- Q.4 a) Construct Binary Tree from given inorder and postorder traversal sequence 10
given below:
Inorder: "INFORMATION"
Postorder : "INOFMAINOTR"
b) Write an BFS and DFS algorithms for graph traversal 10
- Q.5 a) What is an AVL tree? Construct an AVL tree for following set of data: 14, 10, 1, 20,17,24, 18,12,15, 11,4,6 10
b) Write an algorithm to implement insertion sort. Explain its time complexity. 10
- Q.6 Write short note on (any four) 20
a) Red - black tree
b) Selection sort
c) Circular Queue
d) Collision resolution techniques.
e) linear and non linear data structures
