

QP Code : 1151

(3 Hours)

[Total Marks : 100

N.B.: (1) Question No. 1 is compulsory.  
(2) Attempt any four questions out of remaining six questions.

- Q1. a) Explain linear and non-linear data structures with example (5)  
b) What is recursion? State its advantages and disadvantages. (5)  
c) Give different searching techniques. Write a program to implement binary search. (10)
- Q2. a) Write a program to create a single linked list and perform the following operations:-  
i) Insert into list  
ii) Display for data  
iii) Delete from list  
iv) Display the list (10)  
b) Write a program to implement insertion sort and hence sort the following data using insertion sort:-  
5, 3, 2, 1, 4
- Q3. a) Explain different ways to represent graph. Give example. (10)  
b) Explain the working of Merge sort and hence sort the following elements:-  
25, 10, 7, 30, 15, 2, 96, 14 (10)
- Q4. a) Construct binary tree for inorder and preorder traversal sequence given below  
pre-order ABDGCEHIF  
in-order DGBAHEICF  
b) Hash the following in a table of size 11. Use any collision resolution techniques:-  
32, 0, 52, 61, 78, 33, 100, 8, 10, 90, 14 (10)
- Q5. a) Write a program to implement stack using array. (10)  
b) Write short note on B-trees and B+ trees. (10)
- Q6. a) Construct huffman tree and determine code for the following characters whose frequencies are given as:- (10)
- |           |    |    |    |    |    |
|-----------|----|----|----|----|----|
| Character | A  | B  | C  | D  | E  |
| Frequency | 20 | 10 | 10 | 30 | 30 |
- b) What is a binary search tree? Construct BST for the following data  
10, 05, 14, 22, 17, 01, 08 (10)
- Q7. Write short note on (any two):- (20)  
a) AVL tree  
b) Graph traversal algorithms  
c) Priority Queue

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