(3 Hours) [Total Marks : 100

N.B. (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Clearly explain your **logic** using **diagram** and **examples**.

1. (a) Employee·txt is a file having following format : **10**

Emp_Id	Sex	Deptname	Salary
Neumeric	Char	Char	Neumeric

WAP to open and read existing file employee·txt and generate new file new·txt which will store information about all male employees working in Information Technology Department.

(b) Explain the following concepts : **10**
(i) Asymptotic Notations.
(ii) Graph Traversal Techniques.

2. (a) Explain the method of Huffman Coding. How do you construct Huffman Tree ? Apply Huffman Encoding method for MANTRALAYA'. **10**

(b) WAP to create 'STACK' data structure using Linked List implementation ADT should support— **10**
(i) Create stack
(ii) Push stack
(iii) Pop stack
(iv) Destroy stack.

3. (a) Explain Quicksort Algorithms. Sort following numbers using Quicksort. Show output of each pass : **10**

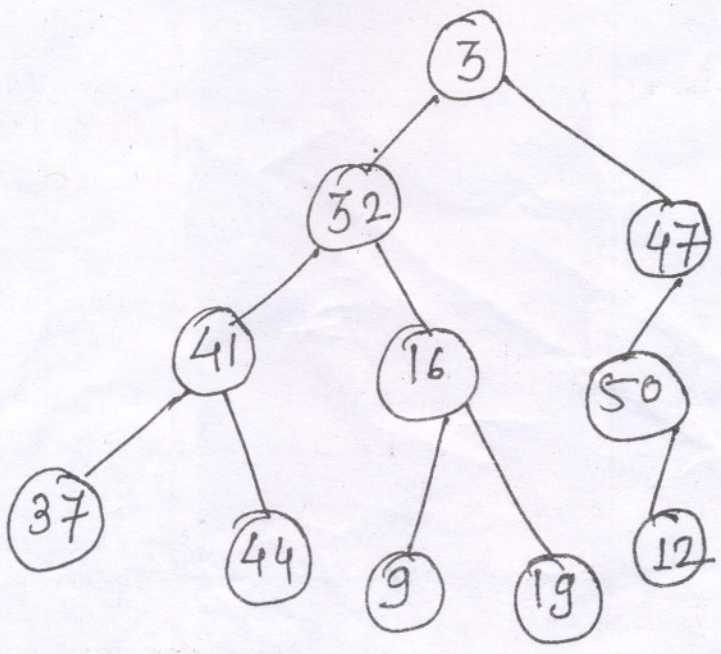
65 70 85 50 75 40 35

(b) WAP to give different types of 'Tree Traversal' techniques. Explain each with an example. **10**

4. (a) WAP to implement singly Linked List and perform following operations on it : **12**
(i) Insert an item
(ii) Delete an item
(iii) Search for an item in the list.

(b) Explain Hashing and its various methods. **8**

5. (a) Show the stepwise method of constructing a heap, given the initial binary tree is :— **10**



(b) Compare between 'Greedy Method' and 'Back-Tracking' method of Programming provide an example of each. **10**

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6. (a) A binary tree has 10 nodes. The inorder and preorder traversal of the tree are shown below. Draw the tree. 5

Preorder : JCBADEFIGH
Inorder : ABCEDFJGIH

(b) Explain the concept of priority Queue. 5
(c) Discuss different applications of graph. 5
(d) Explain structures and union in C. 5

7. Write short notes on following (any **four**):— 20
   (a) Multiway Search Tree
   (b) Collision Handling Mechanism
   (c) Towers of Hanoi
   (d) Knapsack Problem
   (e) Complexity of an Algorithm,
   (f) Threaded Binary Tree.
