

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is **compulsory**.

(2) Attempt any **four** questions from Q.Nos. 2 to 7.

(3) Use **diagrams** wherever **necessary**.

(4) Assume **suitable** data wherever **required** but justify the **same**.

1. (a) Write a program in java to implement Binary search. 10
 (b) What is Recursion & write a program in java to implement "Tower of Hanoi." 10

2. (a) Write a java program to implement circular queue using linked list. 10
 (b) Construct the binary tree for the inorder and post order traversal sequences 10
 given below.
 Inorder : "INFORMATION"
 Post Order : "INOFMAINOTR"

3. (a) Discuss Threaded binary tree in detail. 10
 (b) Write the program in java to perform quick sort. Show the steps with 10
 example.

4. (a) Explain Huffman Coding with example. Write a java program to create 14
 the binary tree using Huffman Coding for the given characters and their
 frequencies. Print the Huffman Code for each character.
 (b) Compare Iteration and Recursion. 6

5. (a) Write a program in java to sort given n integer number using heap sort. 10
 (b) Explain BFS algorithm, explain it by example. 10

6. (a) Write short note on B-Trees and B⁺-Trees. 10
 (b) Hash the following in a table of size 11. Use any two collision resolution 10
 techniques :-
 23, 0, 52, 61, 78, 33, 100, 8, 90, 10, 14.

7. (a) Show with example how graphs are represented in Computer Memory. 6
 (b) Discuss practical application of trees. 4
 (c) Write short notes on :- 10
 (i) AVL Tree
 (ii) Array Representation of Linked List.