

(REVISED COURSE)

(3 Hours)

[Total Marks : 100

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

(2) Attempt any **four** questions out of the remaining **six** questions.

(3) Assume **suitable data** whenever **required** but **justify the same**.

(4) Illustrate answers with **neat sketches** whenever **required**.

1. (a) Write a program in Java to implement 'COPY' command for copying bytes from one file to another file using File I/O commands. Program should make use of command line argument. 10
- (b) What is abstract data type? Write a program in Java to create 'Single Linked List' abstract data type. ADT should support the following Functions :— 10
 - (i) Create Linked list
 - (ii) Insert node in middle
 - (iii) To display list.
2. (a) Explain in detail circular and Priority Queues. 10
- (b) Write a program in Java to sort given n integer numbers using Quick Sort. 10
Show the steps to sort the following numbers.
51 32 10 93 80 19 44 72
3. (a) What is hashing? What is meant by collision? Using modulo-division method and linear probing, store the values given below in array with 10 elements. 10
Show how many collision occurred?
99 33 23 44 56 43 19
- (b) Write a program in Java to implement two stacks in array. 10
4. (a) Write a Java program to convert an expression from Infix to Postfix. Use STACK ADT array implementation in the above program. 10
- (b) Explain the method of Huffman Encoding. Apply Huffman Encoding method for the sentence 'STRUCTURE'. Give Huffman code of each symbol. 10
5. (a) Write a Java function to delete a node from binary search tree. Explain with example by considering all cases. 10
- (b) What is Recursion? Write a program in Java to implement "Tower of Hanoi" problem. 10
6. (a) Discuss Threaded binary tree in detail. 10
- (b) Write a program in Java to implement DFS and BFS traversal of graph using adjacency matrix. 10
7. (a) Write a program in Java to sort given n integer numbers using heap sort. 10
- (b) Write short notes on (any **two**) :— 10
 - (i) AVL Tree
 - (ii) Array Representation of Linked list
 - (iii) B-Tree.