

(REVISED COURSE)

Library

(3 Hours)

[Total Marks : 100

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

1. Explain the following concepts : 20
 - (a) Asymptotic notation
 - (b) Collision handling techniques
 - (c) B-trees
 - (d) Priority queues.

2. (a) Write a program to create a stack using linked list after developing ADT for the same. 10
 (b) Using the above procedures write a program to verify whether the parenthesis in a given arithmetic expression are balanced 10

$$\left\{ \begin{array}{l} \text{Hint } ((a+b)*d) \Rightarrow \text{balanced} \\ (a+b)*d \Rightarrow \text{unbalanced} \end{array} \right\}$$

3. (a) What are different methods of 'file I/O' in C language ? What are the different library functions supported by 'C' language to do the same ? 10
 (b) Design and implement Heap sort algorithm ? 10

4. (a) Write a program to implement Doubly linked list and perform following operations on it : 12
 - (i) Insert an item
 - (ii) Delete an item
 - (iii) Search an item in the list.
 (b) Explain the method of Huffman Coding ? How do you construct Huffman Tree. Explain with example. 8

5. (a) Write a program to merge two ordered link list to form a third ordered link list ? 8
 (b) Design and implement Binary Search Tree such that it should implement following operations : 12
 - (i) Insert
 - (ii) Delete
 - (iii) Print.

6. (a) Implement Hash search algorithm ? Describe in brief the probable Hash functions that can be used for hashing. 10
 (b) Design a recursive Quick sort algorithm. Explain with an example how it works ? 10

7. Write short notes on :
 - (a) Divide and conquer method 6
 - (b) Greedy method 6
 - (c) Graph traversal technique: 8