

(3 Hours)

Total Marks: 80

- N.B.: (1) Question no. 1 is compulsory.  
 (2) Attempt any 3 from the remaining questions.  
 (3) Assume suitable data if necessary.  
 (4) Figures to right indicate full marks.



- |  |    |
|--|----|
| 1. a) Explain linear and non-linear data structure with example  | 05 |
| b) Write ADT for stack. Give application of stack.   | 05 |
| c) Explain practical applications of trees.  | 05 |
| d) What is file? Explain various file handling operations in C.  | 05 |
| 2. a) Write a program in C to perform Quick sort. Show steps with example.   | 10 |
| b) Explain Circular queue and Double ended queue with example.   | 10 |
| 3. a) Write a program to convert an expression from infix to postfix using stack.  | 10 |
| b) Write a function for BFS traversal of graph.  | 10 |
| 4. a) Write a program in C to create a singly linked list and perform the following operations :   | 10 |
| (i) Insert into list   |    |
| (ii) Search for data   |    |
| (iii) Delete from list   |    |
| (iv) Display data.   |    |
| b) Insert the following elements in a AVL search tree:   | 10 |
| 40, 23, 32, 84, 55, 88, 46, 71, 57   |    |
| Explain different rotations used in AVL trees  |    |
| 5. a) Write a program to construct binary tree for the following pre-order and in-order traversal sequences.   | 10 |
| Pre-Order : A B D G C E H I F  |    |
| In-Order : D G B A H E I C F   |    |
| b) What is hashing? What is mean by collision? Using modulo division method insert the following values in a hash table of size 10. Show how many collisions occurred. | 10 |
| 99, 33, 23, 44, 56, 43, 19   |    |
| 6. Write short notes on any four of the following :-   | 20 |
| 1. Huffman coding  |    |
| 2. Iteration VS Recursion  |    |
| 3. Various techniques of Graph representation  |    |
| 4. Threaded binary tree  |    |
| 5. Heap Sort   |    |