

- N.B. : (1) Question No.1 is compulsory.
 (2) Attempt any four out of remaining six questions.
 (3) Subquestions of individual questions should be answered one below the other.
 (4) All questions carry equal marks.
1. (a) Give different methods of carrying out 'File Input/Output' using 'C' language. Also discuss the different library functions supported by 'C' language for each of the above methods. 10
 (b) Given a list of numbers, Write a program to sort these numbers in ascending order using a binary search tree. Print the sorted list. 10
 2. (a) Assume that a file 'IN.DAT' is existing. It stores students records in the ascending order of 'SEAT No'. Each student record consists of the following fields - 10
 SEAT NO 4 digit positive integer
 PHY marks 3 digit +ve integer
 CHEM marks 3 digit +ve integer
 MATHS marks 3 digit +ve integer.
 Using 'Formatted File I/O' method, write a program to update this file to include PCM total (total of PHY, CHEM, MATHS marks) in each record. Also calculate 'percentage PCM total marks' and include these in the student's records. Clearly specify the method of updation used.
 (b) Write a program to create a 'STACK' ADT (Abstract Data Type) using Array implementation. ADT should support the following operations - 10
 (i) Createstack
 (ii) Pushstack
 (iii) Popstack,
 (iv) Destroystack.
 3. (a) (i) Write a note on 'circular queues'. 5
 (ii) Write a note on 'Priority queues'. 5
 (b) Write functions to insert an element and to delete an element from a doubly linked list. Clearly explain all cases of insertion and deletion. Use pointer implementation. 10
 4. (a) Write a program to create a 'Linked List' ADT. ADT should support the following operations - 10
 (i) Creation of the list.
 (ii) Insertion of nodes into the list.
 (iii) Deletion of nodes from the list.
 (b) Explain giving examples how a linked list can be implemented using arrays. Compare Dynamic and Array representations of linked list. 10
 5. (a) Write a program to implement 'QUEUE' using linked list representation. 8
 (b) (i) Write a short note on 'Recursion in C'. 4
 (ii) Write a recursive program to evaluate given PREFIX expression. 8
 6. (a) Explain the method of Huffman Encoding. How is the 'Huffman Tree' constructed? How is the code of any symbol in the alphabet constructed using Huffman Tree? Explain giving example. 10
 (b) Write a note on any one of the following : 10
 (i) Expression Trees
 (ii) Game Trees
 (iii) Threaded Binary Tree
 (iv) Representing Lists as Binary Trees.

7. (a) Write routines to traverse a nonempty binary tree in (i) Preorder 10
(ii) Inorder (iii) Postorder.
- (b) What are the different ways of representing a binary tree ? How would 10
you choose a representation ?

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