Code No: MC1611/R16

MCA I Semester Supplementary Examinations, May-2022

C PROGRAMMING AND DATA STRUCTURES

Time: 3 Hours   **Max. Marks: 60**

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*Answer Any **FIVE** Questions*
All Questions Carry Equal Marks

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1. a Write an algorithm for converting infix expression to prefix expression.   6M
    b Compare singly and circular linked list while performing insertion and deletion operations.   6M

2. a Write an iterative function to search for a key value in Binary search tree.   6M
    b What are the properties of Binary Search Tree?   6M

3. a What are the different tree traversals? Explain with example.   6M
    b Arrange the following list of elements in ascending order using heap sort: 6M
       9, 3, 5, 27, 4, 67, 18, 31, 13, 20, 39, 21.
       Clearly show the quick sort sorting process at each step.

4. a Write a C program to implement Single linked list using arrays.   6M
    b Differentiate between Single linked list and double linked list?   6M

5. a Explain the iterative merge sort and recursive merge sort algorithms with an example.   6M
    b Explain in brief about insertion sort with an example.   6M

6. a What are the applications of priority queues? Write a C program, the implementation of priority queues using pointers.   6M
    b What is an AVL tree? Write the algorithm to search for an element of an AVL search tree.   6M

7. a Convert the given infix Expression ((A+B)*C-(D-E) ^ (F+G)) into its Equivalent Prefix and Postfix Notations.   6M
    b Explain the representation of sparse matrix using linked list.   6M

8. a What is a binary search tree? Write an algorithm for inserting and deleting a node in a binary search tree.   6M
    b Explain Warshall's algorithm to find transitive closure of a graph with a suitable example.   6M

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