RAMAIAH Institute of Technology

Department of Artificial Intelligence and Data Science / Artificial Intelligence and Machine Learning

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QUESTION BANK FOR III SEMESTER (Term: November 2023 – March 2024)

Data Structures Laboratory (ADL36/AIL36)

I.A. Marks: 50 **Exam Hours: 03**

Credits: 0:0:1 **Exam Marks: 50**

1. Write a C program to implement iterative and recursive binary search algorithms. Define and use a macro to compare two integers in your program.
2. Write a C program to find the fast transpose of a sparse matrix.
3. Write a C program to perform pattern matching using KMP Algorithm. (Print the failure function of a pattern and display whether match is found or not).
4. Write a C program to implement a circular queue using dynamically allocated array and perform the following operations on it.
   (i) Insert an item (ii) Delete an item (iii) Display a circular queue
5. Write a C program to evaluate a given postfix expression using a stack.
6. Write a C program to implement multiple linked stacks (at least 5) and perform the following operations on them
   (i) Push an item in i th stack (ii) Pop an item from i th stack (iii) Display i th stack
7. Write a C program to implement multiple linked queues (at least 5) and perform the following operations on them.
   (i) Add an item in i th queue (ii) Delete an item from i th queue (iii) Display i th queue
8. Write a C program to add two polynomials represented as circular linked lists with header nodes. Display both polynomials and the resultant polynomial after addition.
9. Write a C program to implement a doubly linked circular list with a header node and perform the following operations on it.
   (i) Insert a node (iii) Display a doubly linked circular list in forward direction
   (ii) Delete a node (iv) Display a doubly linked circular list in reverse direction

10. Write a C program to implement a max heap using an array and perform the following operations on it.

    (i) Insert an item (ii) Delete an item (iii) Display a heap

11. Write a C program to implement a binary search tree using linked representation and perform the following operations on it.

    (i) Insert an item (ii) Search an item (iii) Inorder Traversal

12. Write a C program to perform depth first search of a graph represented as an adjacency list.

Note:

- **Student is required to solve one problem.**
- **The questions are allotted based on lots.**

Marks Distribution:

Conduction and Result	Write-Up	Execution	Viva/Demo	Change of Program	Total
Marks allotment	07	35	08	-10 Marks	50 Marks