Register No.: ……………………………   Name: ……………………………………………………………..

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER INTEGRATED M.C.A DEGREE EXAMINATION (S), MAY 2022

(2020 SCHEME)

Course Code:	**20IMCAT209**
Course Name:	**Data Structures**
Max. Marks:	**60** **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. Define the term abstract data type.
2. Explain asymptotic notations used in analysis of an algorithm.
3. Write any three operations of an array.
4. Write the algorithm for linear search.
5. What are the advantages of linked list over arrays?
6. How can you concatenate two linked list?
7. Why is stack known as LIFO list?
8. What is a deque?
9. Explain weakly connected graph and weighted graph.
10. What do you mean by a balanced tree?

PART B

(Answer one full question from each module, each question carries 6 marks)

MODULE I

11. Compare and contrast linear data structures and nonlinear data structures.   (6)

OR

12. Discuss about time complexity and space complexity.   (6)

MODULE II

13. Explain the 2D array and its memory representation convention.   (6)

OR

14. With an example, explain merge sort algorithm.   (6)

MODULE III

15. Differentiate the operations performed in doubly linked list and singly linked list.   (6)

OR

16. Explain circular linked list with example.   (6)

MODULE IV

17. Elaborate the dynamic implementation of stack.   (6)

OR

18. Write an algorithm to convert an infix expression into postfix notation. Convert the following infix expression into its equivalent postfix expression. (6)
(A + B / C) – (D * E + F)

MODULE V

19. Explain BFS and DFS. (6)

OR

20. Explain the algorithm to insert an element in a binary search tree with example. (6)

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