PG/IS/MCA/108/24

MCA 1st Semester Examination, 2024

MCA

(*Data Structure and Algorithm Lab*)

PAPER – MCA-108

Full Marks : 100

Time : 3 hours

Answer **all** questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP—A

Answer any **one** question : 35×1

1. Implement singly linked list to create, insert and delete nodes.

2. Write a program to implement simple Stack and their operations using array.

3. Implement Inorder, Preorder and Post Order traversal of a binary tree using both recursive and non-recursive way.

4. Write a program to create a binary search tree search a specific node in the tree.

5. Develop a program to implement to create an AVL tree along with insertion and deletion operations.

6. Write a menu driven program that implements a Heap (Max or Min) for the following operations. Insert, Delete.

7. Convert any given infix expression to postfix expression by writing a program.

8. Develop a program to represent a polynomial. Also write methods for adding and subtracting two polynomials.

9. Write a program to implement double hashing technique to map given key to the address space.

10. Using a program show how the collision resolution (linear probing) works in hashing.

GROUP–B

Answer any **one** question : 35×1

11. Write a program to sort a set of given numbers using quicksort.

12. Implement merge sort algorithm and test it with given numbers.

13. Using a program, find the minimum number of multiplications needed to multiply a chain of matrices using dynamic programming approach.

14. Find the longest common subsequence from two given strings by writing a program using dynamic programming approach.

15. Write a program to solve a given 0/1 knapsack problem.

16. Find the shortest distances between every pair of vertices in a given edge weighted directed graph by writing a program using dynamic programming approach.

17. Write a program to implement Breadth First search of any given graph.

18. Implement a program for Kruskal's algorithm to find the minimum spanning tree of a given graph.

19. Write a program to implement depth first search using linked representation of graph.

20. Develop a program to find the minimum spanning tree of a given graph using Prim's algorithm.

PNB – 10 Marks

Viva – 20 Marks
