

U.G. 3rd Semester Examination - 2021**COMPUTER SCIENCE****[HONOURS]****Course Code : COM.SC-H-CC-P-305****(Data Structures Lab)****[PRACTICAL]**

Full Marks : 75

Time : 4 Hours

*The figures in the right-hand margin indicate marks.***Marks Distribution :****Experiment : 60 Marks****Viva-voce : 10 Marks****Lab Notebook : 05 Marks**Answer any **one** question to be selected on lottery basis.

Each question carries 60 marks.

1. Write a program to search an element from a list. Give user the option to perform Linear or Binary search. Use Template functions.
2. Write a program to sort a list of elements. Give user the option to perform sorting using Insertion sort, Bubble sort or Selection sort.
3. Write a program to implement Linked List. Include functions for insertion, deletion.

4. Implement Doubly Linked List using templates. Include functions for searching of a number, and reverse the list.
5. Write a program to implement Circular Linked List. Include functions for insertion and deletion.
6. Write a program to perform Stack operations using Linked List implementation.
7. Write a program to perform Stack operations using Array implementation..
8. Write a program to perform Queue operations using Circular Array implementation.
9. Write a program to create and perform different operations on Double-ended Queues using Linked List implementation.
10. Write a program to represent a polynomial using linked list and add two polynomials.
11. Write a program to calculate factorial and to compute the factors of a given no. (i) using recursion, (ii) using iteration.
12. Write a program to display Fibonacci series (i) using recursion, (ii) using iteration.
13. Write a program to calculate GCD of two numbers (i) with recursion (ii) without recursion.

[Turn over]

14. Write a program to create a Binary Search Tree and include following operations in tree: (a) Insertion (b) Deletion (c) Display its pre-order, post-order and in-order traversals.
 15. Write a program to convert the Sparse Matrix into non-zero form and vice-versa.
 16. Write a program to reverse the order of the elements in the stack using additional stack.
 17. Write a program to reverse the order of the elements in the stack using additional Queue.
 18. Write a program to implement Diagonal Matrix using one-dimensional array.
 19. Write a program to implement Lower Triangular Matrix using one-dimensional array.
 20. Write a program to implement Upper Triangular Matrix using one-dimensional array.
 21. Write a program to implement Symmetric Matrix using one-dimensional array.
 22. Write a program to create a Threaded Binary Tree as per in-order traversal and implement operations like finding the successor and predecessor of an element, insert an element, in-order traversal.
 23. Write a program to implement various operations on AVL Tree.
-