|  |  |
| --- | --- |
| **Course Outcomes** | |
| CO1 | To learn the different types of data structures, operations on them and applications (Understand) |
| CO2 | To choose the appropriate data structure and algorithm for a specified application. (Apply) |
| CO3 | To analyze various sorting and searching techniques with applications. (Analyze) |
| CO4 | To implement linear data structure such as stacks, queues, linked lists and their applications (Create) |
| CO5 | To implement non-linear data structure such as trees, graphs and their applications (Create) |

|  |  |  |
| --- | --- | --- |
| **Lab** | **Program** | **CO** |
| 1. | Write a program that implement array operations a) Insertion b) Deletion c) Traversal | CO1 |
| 2. | Write a program that implements the following sorting  a) Bubble sort b) Insertion sort c) Selection sort | CO1, CO3 |
| 3. | Write a program that implements the following  a) Quick Sort b) Merge sort | CO1, CO3 |
| 4. | Write a program for searching an element from the given list  a) Linear search b) Binary search. | CO1, CO3 |
| 5. | Write a program to implement STACK using array that performs following operations: (a) PUSH (b) POP (c) Display (d) isEmpty (e) isFull | CO2,  CO4 |
| 6. | Write a program to implement Queue using arrays that perform the following operations. (a) Insert (b) Delete (c) Display (d) isEmpty (e) isFull | CO2,  CO4 |
| 7. | Write a program to implement Circular Queue using arrays that perform the following operations. (a) Insert (b) Delete (c) Display (d) isEmpty (e) isFull | CO2,  CO4 |
| 8. | Implement a program to convert infix notation to postfix notation using stack | CO1, CO4 |
| 9. | Write a program that uses functions to perform the following operations on singly linked list i) Creation ii) Insertion & Deletion at the beginning, at the end and at the specific position iii) Traversal | CO2,  CO4 |
| 10. | Write a program that uses functions to perform the following operations on Circular linked list i) Creation ii) Insertion & Deletion at the beginning, at the end and at the specific position iii) Traversal | CO2,  CO4 |
| 11. | Write a program that uses functions to perform the following operations on Circular doubly linked list i) Creation ii) Insertion & Deletion at the beginning, at the end and at the specific position iii) Traversal | CO2,  CO4 |
| 12. | (i) Write a program to implement a stack using a linked list.  (ii) Write a program to implement a queue using a linked list | CO2,  CO4 |
| 13. | Write a program to perform the following operations:  a) Insert an element into a binary search tree.  b) Delete an element from a binary search tree. | CO5 |
| 14. | Write a program to perform the following operations:  a) Traversing all the elements of a binary search tree.  b) Search for a key element in a binary search tree. | CO5 |

|  |
| --- |
| **Software Required** |
| * Code::Blocks/Visual Studio Code |

|  |  |
| --- | --- |
| **Subject In-charge** | **Head of the Department** |