

Program: - CM/IF3K

Semester: - III

Course and code: - Data Structure Using C (313301)

Chapter no 1: Introduction to Data Structures

(2 Marks)

- 1) Write any four operations on data structure.(CO1)
- 2) Explain linear and non-linear data structures. (CO1)
- 3) Define complexity and classify it. (CO1)
- 4) Define Abstract data type. (CO1)
- 5) Give classification of data structure. (CO1)

(4 Marks)

- 6) Implement a C program to insert an element in an array.(CO1)
- 7) Differentiate between linear and non-linear data structure.(any four points) (CO1)
- 8) Explain time and space complexity with an example. (CO1)
- 9) Write a C program for deletion of an element from an array. (CO1)
- 10) Define the term recursion. Write a program in C to display factorial of an entered number using recursion. (CO1)

Chapter no 2: Searching and Sorting

(2 Marks)

- 1) Define Searching. What are its types? (CO2)
- 2) State the following terms.(CO2)
 - i) Searching
 - ii) Sorting

(4 Marks)

- 3) Sort the following numbers in ascending order using Insertion sort: (CO2)
25,15,4,103,62,9
- 4) Differentiate between Binary search and Linear search with respect to any four parameters. (CO2)
- 5) Find the position of element 29 using Binary search method in an array given as : (CO2)

- 11,5,21,3,29,17,2,43
- 6) Write a program to implement bubble sort. (CO2)
 - 7) Describe working of linear search with example. (CO2)
 - 8) Write a program to implement insertion sort. (CO2)
 - 9) Sort the following numbers in ascending order using quick sort. (CO2)
50,2,6,22,3,39,49,25,18,5
 - 10) Sort the following numbers in ascending order using Bubble sort.
29,35,3,8,11,15,56,12,1,4,85,5
 - 11) Elaborate the steps for performing selection sort for given elements of array. (CO2)
37,12,4,90,49,23,-19
 - 12) Describe working of binary search with example. (CO2)

Chapter no 3: Linked List

(2 Marks)

- 1) Define the following term.(CO3)
 - i) Next pointer
 - ii) Null pointer
- 2) What is node in singly linked list. Explain with an example. (CO3)
- 3) What is dynamic memory allocation? (CO3)
- 4) List any four applications of linked list? (CO3)
- 5) List types of lists. (CO3)

(4 Marks)

- 6) Write an algorithm to delete a node at the beginning from a singly linked list.(CO3)
- 7) Write an algorithm to delete an intermediate node in a singly linked list. (CO3)
- 8) Create a singly linked list using data fields 10,20,30,40,50 and show procedure step-by-step with the help of diagram from start to end. (CO3)
- 9) Write an algorithm to insert a new node at the beginning in singly linked list. (CO3)
- 10) Write a 'C' function for searching a node in singly linked list. (CO3)
- 11) Write a 'C' function to count number of nodes in singly linked list. (CO3)
- 12) Create a singly list using data field 15,20,22,58,60. Search a node 22 from the SLL and show procedure step-by-step with the help of diagram from start to end. (CO3)
- 13) Differentiate between Static and Dynamic memory allocation. (CO3)