**UNIT 1**

1. Define Data Structures.Explain the various categories of data structures in detail.
2. For handling marks of a student in 10 subjects which one is efficient usage of variables or arrays. Justify your answer.
3. In an organization the details of an employee like his name, date of joining, empid, address, phone no have to be stored which would be the best method of handling the above data.
4. What are Self Referential structures. List its application with an example.
5. The program structure of a structure and union are almost similar, then state few points that differentiate both.
6. What is Dynamic memory allocation? , What are the functions using which it is handled?
7. Differentiate malloc( ) and calloc( ) with an example.
8. State the difference between Memory leak and dangling references in the pointers concept.
9. Illustrate the way how arrays can be represented, For storing a set of 94 employee phone numbers how much of memory is required.
10. What are Sparse matrix, How are they represented using arrays and linked list.
11. Given a Sparse matrix 1 0 0 0 0 0

0 0 0 2 7 0

3 0 0 0 0 1

1. 0 0 0 9 0

represent the matrix using arrays and linked list. Explain the importance of Sparse matrices in Multi Dimensional arrays.

1. What are character arrays. Explain the various string handling functions with their appropriate syntax.
2. Write a C program for strcmp(), strlen(), strcpy(), strrev() without using inbuilt functions.
3. What are the various pattern matching algorithms. Explain the naïve/Brute force pattern matching algorithm in detail considering an example.
4. Define Insertion sort, Implement insertion sort on a set of 8 numbers in unsorted order.
5. Define Radix sort, Implement radix sort on a set of 6 numbers in unsorted order.
6. Define Address calculation sort, Implement address calculation sort on a set of 15 numbers in unsorted order.
7. Given a set of 10 unsorted numbers explain how binary search is better over linear search.

**UNIT 2**

1. Define stack and list all its applications.
2. List the various stack operations with an example each.
3. Given an array size of 10 and top=9 push the following elements 65,32 and display all the elements after PUSH operation.
4. Write an algorithm that states the POP() operation on stack. Given that top=-1. Pop the first 2 elements from the stack and display them
5. What do you mean by Top of the stack? , explain the various ways of how a stack can be implemented. List the default value of top of stack in each type of representation.
6. Write a brief note on Stack data structure.
7. Outline the operations that can be performed on stack data structure.
8. List the applications of stack.
9. Convert the following infix notation to postfix notation

a / b – c + d \* e – a \* c

( ( a + b ) / d - ( ( e - f ) + g )

trace that postfix expression for given data a = 6, b = 3, c = 1, d = 2, e = 4, f=5, g=7

convert the obtained postfix notation to infix notation.

1. Write a C Program to find Fibonacci Series using Recursion
2. Write a C Program to find GCD using Recursion
3. Write a short note on Queues.
4. Distinguish between stacks and Queues.
5. Explain the algorithm to implement a circular queue with suitable example.
6. Write-down the operations performed on Queue.