



**Nutan Maharashtra Vidya Prasarak Mandal's  
Nutan Maharashtra Inst. of Engg. & Tech.**

Record No.: **ACDM/R/045**

Revision: **00**

Date:

**SE- Data Structure Lab  
List of Problem Statements**

1) In second year Computer Engineering class, group A student's play Cricket, group B student's play badminton and group C students play football

Write a **Python** program using functions to compute following: -

- a) List of students who play both cricket and badminton
- b) List of students who play either cricket or badminton but not both
- c) Number of students who play neither cricket nor badminton
- d) Number of students who play cricket and football but not badminton.

(Note- While realizing the group, duplicate entries should be avoided, do not use SET built-in functions)

OR

1) Write C++ program for converting infix expression to postfix  $(A+(B+C)*D)+P$

2) Write a **Python** program to compute following operations on String (Do not use string built-in functions):

- a) To display word with the longest length
- b) To determine the frequency of occurrence of particular character in the string
- c) To check whether given string is palindrome or not
- d) To display index of first appearance of the substring
- e) To count the occurrences of each word in a given string

OR

2) Write C++ program for implementation of Single Linked List with five nodes for storing student roll no and perform following operations on it

- a) Adding new roll no at the end
- b) Adding new roll no at the beginning
- c) Adding new roll no at the given location

3) Write a **Python/C++** program to compute following computation on matrix:

- a) Addition of two matrices B) Subtraction of two matrices
- c) Multiplication of two matrices d) Transpose of a matrix

OR

3) Write C++ program for implementation of Circular Queue with following operations

- a) enqueue(10), enqueue(20), enqueue(30), enqueue(40), enqueue(50),
- b) dequeue(), dequeue(), dequeue(),
- c) Display all the elements

4) Write a **Python/C++** program to store first year percentage of students in array. Write function for sorting array of floating point numbers in ascending order using

- a) Selection Sort
- b) Bubble sort and display top five scores.

OR

4) Write C++ program for implementation of Linear Queue with following operations

- a) enqueue(10), enqueue(20), enqueue(30), enqueue(40), enqueue(50),
- b) dequeue(), dequeue(), dequeue(),
- c) Display all the elements

5) Write a **Python/C++** program to store first year percentage of students in array. Write function for sorting array of floating point numbers in ascending order using quick sort or bucket sort and display top five scores.

OR

6) Write C++ program for Matrix Operations

- a) Addition of two 3\*3 matrix
- b) Transpose of 3\*3 matrix

6) Write a **Python/C++** program to store second year percentage of students in array. Write function for sorting array of floating point numbers in ascending order using

- a) Insertion sort
- b) Shell Sort and display top five scores

OR

6) Write C++ program for Matrix Operations

- a) Subtraction of two 3\*3 matrix
- b) Multiplication of 3\*3 matrix

7) Department of Computer Engineering has student's club named 'Pinnacle Club'. Students of second, third and final year of department can be granted membership on request. Similarly one may cancel the membership of club. First node is reserved for president of club and last node is reserved for secretary of club. Write C++ program to maintain club member's information using singly linked list. Store student PRN and Name. Write functions to:

- a) Add and delete the members as well as president or even secretary.
- b) Compute total number of members of club
- c) Display members
- d) Two linked lists exists for two divisions. Concatenate two lists

OR

7) Write C++ program for implementation of stack with following operations

- a) push(10), push(20), push(30), push(40), push(50),
- b) pop(),
- c) Display all the elements

8) Write C++ program with functions

- a) To print original string followed by reversed string using stack
- b) To check whether given string is palindrome or not

OR

8) Write C++ code to search student roll number in the roll no array of SE students using binary search

9) Implement C++ program for expression conversion as infix to postfix and its evaluation using stack based on given conditions:

- 1. Operands and operator, both must be single character.
- 2. Input Postfix expression must be in a desired format.
- 3. Only '+', '-', '\*' and '/' operators are expected

OR

9) Write C++ code to search student roll number in the roll no array of SE students using linear search

10) Queues are frequently used in computer programming, and a typical example is the creation of a job queue by an operating system. If the operating system does not use priorities, then the jobs are processed in the order they enter the system. Write C++ program for simulating job queue. Write functions to add job and delete job from queue.

OR

10) Pizza parlor accepting maximum M orders. Orders are served in first come first served basis. Order once placed cannot be cancelled. Write C++ program to simulate the system using circular queue using array.

OR

11) Write C++ program for following operations

- a) Bubble sort for sorting numbers in ascending order 2 6 5 9 8 3 4 6 8 7
- b) Bubble sort for sorting numbers in descending order 6 9 8 7 5 7 9 2 1 6

OR

11) Write C++ code to search student roll number in the roll no array of SE students using binary search