1) **Program on class and object**

1.1) Develop a C++ program consisting of a class called Employee with name, ID, department and basic salary as data members. Include member functions to:

a) **set values for data members**
b) **compute gross salary where DA=70% of basic, HRA=20% of basic and deductions=5% of basic and**
c) **Display details of an employee**

1.2) Create a menu driven C++ application that stores price list of 5 items. It also provides a facility to print the largest price among all the elements. It also computes the sum of all prices using class and objects in C++ .

1.3) Create a class to represent a bank account. Include the following members:
Data members

a. name of the depositor
b. account number
c. balance amount

Member functions

a. To assign initial values
b. To deposit an amount
c. To withdraw an amount after checking the balance
d. To display details of the account

Write a menu driven main function that calls the member functions until the user chooses to terminate the program.

1.4) Develop a C++ program with a class called car having data members brand , model and year. Write the appropriate member functions to set the values of the

data members using scope resolution operator and also display the details of the car using objects.

2) **Program illustrating the use of reference types in C++**

2.1) Write a C++ program to swap two variables using reference variables.

2.2) Write a C++ function power(int, int, int &) that takes two integer variables (say a and b) and an integer reference variable as parameter, computes a ^ b and stores the result in the reference variable. Write the associated main() to call this function.

2.3) Consider n students' records, each consisting of name, USN and marks in three tests and average. Develop a C++ program to read name, USN and marks in three subjects. Write a function that updates the average field (using reference parameter) by computing average of best two marks. Display the updated student records.

2.4) Write a function exchange(int &, int &, int &) that uses reference variables to cyclically exchange values contained in three variables. Write the associated main to exercise this function.

3) **Program on function overloading**

3.1) Write a C++ program to calculate the area of circle (given the radius), rectangle (given the two sides) and triangle (given the three sides) using function overloading.

3.2) Develop a menu driven C++ program with overloaded functions to sort arrays of integers, floats and characters.

3.3) Write a C++ program to calculate maturity value of investment using function overloading. One function computes the maturity value using simple interest

formula and the other function computes the maturity value using compound interest formula.

Formula for maturity value using simple interest calculation: p + (p * t * r / 100)

Formula for maturity value using compound interest: p((1 + r / n) ^ (n * t))

where,

p is the principal amount

r is the rate of interest

t is the time duration of investment

n is the number of times interest is compounded per year

3.4) Write the following overloaded functions:

i. strcopy(s1, s2) that copies all the characters of s2 to s1

ii. strcopy(s1, s2, n) that copies the first n characters of s2 to s1

Write the associated main to exercise these functions.

4) Program on dynamic memory management in C++

4.1) Create an array using dynamic memory allocation. Write functions to perform the following:

a. Find the minimum element in the array

b. Find the maximum element in the array

c. Find the mean of the elements in the array

4.2) Develop a C++ program to illustrate dynamic allocation and deallocation of memory using new and delete operators for an array of n integers. Include functions to

a. read the elements

b. find the number of even and odd integers in the array and

c. display the elements

4.3) Create a C++ application that receives the test scores from the user. The application computes the average of test scores. It also displays the scores in

ascending order. The application does dynamic allocation of memory for storing the scores.

4.4) Develop a C++ program to read records of n items as per the following structure:

```
struct Item{
        int itemCode;
        string name;
        float price;
};
```

Create the array of structures using dynamic memory allocation. Write functions

a. to read the records and
b. display item having highest price.