Computer Science and Engineering Department, SVNIT - Surat
Mid Sem Examination- September - 2021
B.Tech. IV – Sem. -VII
Course: Principles of Programming Languages (CO405)
Section B

Date: 29th September 2021 **Marks:** 15

Instructions:
1. Write your Admission No/Roll No and other details clearly on the answer books.
2. Be precise and clear in answering the questions.
3. Support your answer with necessary diagrams and examples.

Q1 Answer the following questions: (02 marks each) **[06]**

1. Write a class template to represent a generic vector. Include member functions to perform the following tasks:

(a) To create the vector

(b) To modify the value of a given element

(c) To multiply by a scalar value

(d) To display the vector in the following form (10, 20, 30 …)

2. 1. Class D is derived from class B. The class D does not contain any data members of its own. Does the class D require constructors? If yes, why?
2. When do we use the protected visibility specifier to a class member?

3. Find the Errors (if any) and Correct the errors in the following program:

```
class test
{
  private:
       int m;
 public:
     void getdata()
{
   cout << " Enter number:";
  cin >> m;
}
void display()
{
     cout <<m;
 };
main()
{
test T;
T->getdata();
T->display();
test *p;
p = new test;
p.getdata();
(*p).display();
}
```

Q2 Answer the following questions: (03 marks each) **[09]**

1. Create two classes SM and SB which store the value of distances. SM stores distances in meters and centimeters and SB in feet and inches. Write a program that can read values for the class objects and add one object of SM with another object of SB. Use a friend function to carry out the addition operation. The object that stores the results may be a SM object or SB object, depending on the units in which the results are required. The display should be in the format of feet and inches or meters and centimeters depending on the object on display. (write sample Output also)

2. A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book, the sales person inputs the title and author and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed. If it is, then the system displays the book details and requests for the number of copies required. If the requested copies are available, the total cost of the requested copies is displayed; otherwise "Required copies not in stock" is displayed. Design a system using a class called bookshop with suitable member functions and constructors. Use new operator in constructors to allocate memory space required.(write sample Output also)

3. Assume that a bank maintains two kinds of accounts for customers, one called as savings and the other as current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level a service charge is imposed. Create a class account that stores customer name, account number and type of account. From this derive the classes currunt_acc and savings_acc to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:

(a) Accept the deposit from a customer and update the balance.

(b) Display the balance.

(c) Compute and deposit interest.

(d) Permit withdrawal and update the balance.

(e) Check for the minimum balance, impose penalty, necessary and update the balance.

(write sample Output also)