**C++ Assignments**

1. //Covers class,objects,access specifiers

C++ Program to Define a Class BOOK and accessing member function using its object

1)Define a class BOOK with the following specifications :

Private members of the class BOOK are

BOOK NO integer type

BOOKTITLE 20 characters

PRICE float (price per copy)

TOTAL\_COST() A function to calculate the total cost for N number of copies where N is passed to the function as argument.

Public members of the class BOOK are

INPUT() function to read BOOK\_NO. BOOKTITLE, PRICE

PURCHASE() function to ask the user to input the number of copies to be purchased. It invokes TOTAL\_COST() and prints

the total cost to be paid by the user.

1. Write the definition for a class called Rectangle that has floating point data members length and width. The class has the following member functions:

void setlength(float) to set the length data member

void setwidth(float) to set the width data member

float perimeter() to calculate and return the perimeter of the rectangle

float area() to calculate and return the area of the rectangle

void show() to display the length and width of the rectangle

int sameArea(Rectangle) that has one parameter of type Rectangle. sameArea returns 1 if the two Rectangles have the same area, and returns 0 if they don't.

1. Write the definitions for each of the above member functions.

2. Write main function to create two rectangle objects. Set the length and width of the first rectangle to 5 and 2.5. Set the length and width of the second rectangle to 5 and 18.9. Display each rectangle and its area and perimeter.

3. Check whether the two Rectangles have the same area and print a message indicating the result. Set the length and width of the first rectangle to 15 and 6.3.

Display each Rectangle and its area and perimeter again. Again, check whether the two Rectangles have the same area and print a message indicating the result.

1. //Covers constructor and destructor

Answer the questions (i) and (ii) after going through the following class:

class Test

{

char paper[20];

int marks;

public:

Test () // Function 1

{

strcpy (paper, "Computer");

marks = 0;

}

Test (char p[]) // Function 2

{

strcpy(paper, p);

marks = 0;

}

Test (int m) // Function 3

{

strcpy(paper,"Computer");

marks = m;

}

Test (char p[], int m) // Function 4

{

strcpy (paper, p);

marks = m;

}

};

i. Write statements in C++ that would execute Function 1, Function 2, Function 3 and Function 4 of class Test.

ii. Which feature of Object Oriented Programming is demonstrated using Function 1, Function 2, Function 3 and Function 4 together in the above class Test?

1. //Covers Constructor and Destructor

Consider the definition of the following class:

class Sample

{

private:

int x;

double y;

public :

Sample(); //Constructor 1

Sample(int); //Constructor 2

Sample(int, int); //Constructor 3

Sample(int, double); //Constructor 4

};

i. Write the definition of the constructor 1 so that the private member variables are initialized to 0.

ii. Write the definition of the constructor 2 so that the private member variable x is initialized according to the value of the parameter, and the private member variable y is initialized to 0.

iii. Write the definition of the constructors 3 and 4 so that the private

member variables are initialized according to the values of the parameters.

1. **Mini Project Activity:**

A common place to buy candy is from a machine. The machine sells candies, chips, gum, and cookies. You have been asked to write a program for this candy machine.

The program should do the following:

1. Show the customer the different products sold by the candy machine.

2. Let the customer make the selection.

3. Show the customer the cost of the item selected.

4. Accept money from the customer.

5. Release the item.

The machine has two main components: a built-in cash register and several dispensers to hold and release the products.

Define class cashRegister in C++ with the following descriptions :

Private Members:

cashOnHand of type integer

Public Members:

A default constructor cashRegister() sets the cash in the register to 500.

A constructor cashRegister(int) sets the cash in the register to a specific amount.

A function getCurrentBalance() which returns value of cashOnHand

A function acceptAmount(int) to receive the amount deposited by the customer and update the amount in the register

Define class dispenserType in C++ with the following descriptions :

Private Members:

numberOfItems of type integer

cost of type integer

Public Members:

A default constructor dispenserType () sets the cost and number of items in the dispenser to 50 each.

A constructor dispenserType (int,int) sets the cost and number of items in the dispenser to the values specified by the user.

A function getNoOfItems() to return the value of numberOfItems.

A function getCost() to return the value of cost.

A function makeSale() to reduce the number of items by 1.

When the program executes, it must do the following:

1. Show the different products sold by the candy machine.

2. Show how to select a particular product.

Once the user has made the appropriate selection, the candy machine must act accordingly. If the user has opted to buy a product and that product is available, the candy machine should show the cost of the product and ask the user to deposit the money. If the amount deposited is at least the cost of the item, the candy machine should sell the item and display an appropriate message.

Divide this program into three functions: showSelection, sellProduct, and main.

The function sellProduct must have access to the dispenser holding the product (to decrement the number of items in the dispenser by 1 and to show the cost of the item) as well as the cash register (to update the cash). Therefore, this function has two parameters: one corresponding to the dispenser and the other corresponding to the cash register.