I)Wrire short notes on:-

a) Class:-

- A class in C++ is a user defined type or data structure declared with keyword 'class' that has data and functions as its members whose access is governed by the three access specifiers private, protected and public. By default access to member of a C++ class is private.The private memebers are not accesible outside the class; they can be accessed only through methods of the class.The public members from an interface to a class and are accessible outside the class.
- A class in C++ is the building block, that leads to Object-Oriented programming. It is a user-defined data type, which holds its own data members and member functions, which can be accessed and used by creating an instance of that class. A C++ class is like a blueprint for an object.
- For Example: Consider the Class of Cars. There may be many cars with different names and brand but all of them will share some common properties like all of them will have 4 wheels, Speed Limit, Mileage range etc. So here, Car is the class and wheels, speed limits, mileage are their properties.

```
#include <iostream>

class Box {

  public:

    double length;   // Length of a box

    double breadth;  // Breadth of a box

    double height;   // Height of a box

};

int main() {
```

```
   Box Box1;        // Declare Box1 of type Box
   Box Box2;        // Declare Box2 of type Box
   double volume = 0.0;     // Store the volume of a box here
    // box 1 specification
   Box1.height = 5.0;
   Box1.length = 6.0;
   Box1.breadth = 7.0;
  // box 2 specification
   Box2.height = 10.0;
   Box2.length = 12.0;
   Box2.breadth = 13.0;
     // volume of box 1
   volume = Box1.height * Box1.length * Box1.breadth;
   cout << "Volume of Box1 : " << volume <<endl;
    // volume of box 2
   volume = Box2.height * Box2.length * Box2.breadth;
   cout << "Volume of Box2 : " << volume <<endl;
   return 0;
}
```

Output:-

```
Volume of Box1 : 210
Volume of Box2 : 1560
```

b)Constructor:-

- A constructor is a member function of a class which initializes objects of a class. In C++, Constructor is automatically called when object(instance of class) create. It is special member function of the class.
- A class constructor is a special member function of a class that is executed whenever we create new objects of that class.
- A constructor will have exact same name as the class and it does not have any return type at all, not even void. Constructors can be very useful for setting initial values for certain member variables.
- A constructor is different from normal functions in following ways:
    i. Constructor has same name as the class itself
    ii. Constructors don't have return type
    iii. A constructor is automatically called when an object is created.
    iv. If we do not specify a constructor, C++ compiler generates a default constructor for us (expects no parameters and has an empty body).

```
#include <iostream>

class Area

{    private:

      int length;

      int breadth;

    public:

      // Constructor

      Area(): length(5), breadth(2){ }

  void GetLength()

      {

         cout << "Enter length and breadth respectively: ";
```

```
        cin >> length >> breadth;
    }
   int AreaCalculation() {  return (length * breadth);  }
    void DisplayArea(int temp)
    {
        cout << "Area: " << temp;
    }
};
int main()
{
   Area A1, A2;
   int temp;
   A1.GetLength();
   temp = A1.AreaCalculation();
   A1.DisplayArea(temp);
  cout << endl << "Default Area when value is not taken from user" << endl;
   temp = A2.AreaCalculation();
   A2.DisplayArea(temp);
   return 0;
}
```

Output:-

```
Enter length and breadth respectively: 6
7
```

Area: 42

Default Area when value is not taken from user

Area: 10

III)Write a program to write a program in C++ that uses friend function to swap the members of the class.

```
#include<iostream.h>

#include<conio.h>

class temp

{

private:

int x,y,q;

public:

void get_data()

{

cout<<"\n e\Enter two numbers: ";

cin>>x>>y;

}

friend void swap(temp & t);

void show_data()

{

cout<<"\n After swap x is : "<<x;

cout<<"\n After swap y is : "<<y;

}

};
```

```
void swap(temp & t)
{
t.q=t.x;
t.x=t.y;
t.y=t.q;
}
void main()
{
clrscr();
tmep t1;
t1.get_data();
swap(t1);
t1.show_data();
getch();
}
```

Output:-

```
Enter two numbers:  10   20
After swap x is : 20
After swap y is : 10
```