Institute of Computer Technology
B. Tech Computer Science and Engineering
Subject: ESFP-II (2CSE203)

PRACTICAL-7

AIM: - To learn about Inheritance in C++.

1. Implement a class government having two subclasses finance and defense. Now make a child Minister which should have finance and defense as parent class. Classes Government must possess a function Budget which display the message you will get budget less than 4000 crores. Make the object of Minister and access the function budget.

CODE:

```
#include <iostream>
using namespace std;

class Government{
   public:
   void Budget()
   {
   cout<<"\nYou will get budget less than 4000 crores.";
   }
};
class Finance : public Government {

};
class Defence : public Government {

};
class Minister : public Finance,Defence{

};

int main()
{
   Minister obj;
   obj.Finance::Budget();
   return 0;
}
```

OUTPUT:

```
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practic
als\Prac-7> cd "c:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2
\ESFP-Practicals\Prac-7\" ; if ($?) { g++ P7Q1.cpp -o P7Q1 } ;
if ($?) { .\P7Q1 }

You will get budget less than 4000 crores.
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practic
als\Prac-7>
```

2. Create two classes, A and B, with default constructors that announce themselves. Inherit a new class called C from A, and create a member object of B in C, but do not create a constructor for C. Create an object of class C and observe the results.

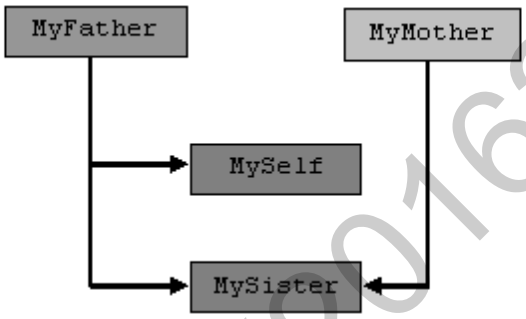
CODE:

```
#include<iostream>
using namespace std;
class A
{
   public:
   A()
   {
      cout<<"\nThis is class A";
   }
};
class B
{
   public:
   B()
   {
      cout<<"\nThis is class B.";
   }
};

class C:public A
{
   public:
   B obj;
};

int main()
{
   C obj1;
   return 0;
}
```

OUTPUT:

```
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practic
als\Prac-7> cd "c:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2
\ESFP-Practicals\Prac-7\" ; if ($?) { g++ P7Q2.cpp -o P7Q2 } ;
if ($?) { .\P7Q2 }

This is class A
This is class B.
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practic
als\Prac-7>
```

3. Implement a following scenario using C++ Inheritance: (Use Name & Eye color Data member to print the results)



CODE:

```
#include <iostream>
using namespace std;
class MyFather{
   public:
   void F(){
      cout<<"\nFather Name: Prakash";
      cout<<"\nEye Color: Green";
   }
};
class MyMother{
   public:
   void M(){
      cout<<"\nMother Name: Sangita";
      cout<<"\nEye Color: Dark-Brown";
   }
};
class MySelf:public MyFather{
   public:
   void Y(){
      cout<<"\nMy Name: Yash";
      cout<<"\nEye Color: Dark-Brown";
```

```
    }
};
class MySister:public MyMother,MyFather{
    public:
    void X(){
        cout<<"\nSister Name: XYZ";
        cout<<"\nEye Color: Black";
    }
};

int main(){
    MySelf obj;
    obj.F();
    obj.Y();
    MySister obj1;
    obj1.M();
    obj1.X();
    return 0;
}
```

OUTPUT:

```
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practic
als\Prac-7> cd "c:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2
\ESFP-Practicals\Prac-7\" ; if ($?) { g++ P7Q3.cpp -o P7Q3 } ;
if ($?) { .\P7Q3 }

Father Name: Prakash
Eye Color: Green
My Name: Yash
Eye Color: Dark-Brown
Mother Name: Sangita
Eye Color: Dark-Brown
Sister Name: XYZ
Eye Color: Black
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practic
als\Prac-7>
```

Post Practical Work

1. Write a Program in C++ to illustrate the order of execution of constructors and destructors in inheritance.

CODE:

```
#include<iostream>
using namespace std;
class A{
    public :
    A()
    {
```

```
        cout<<"First Constructor"<<endl;
    }
    ~A()
    {
        cout<<"\nFirst Destructor"<<endl;
    }
};
class B : public A{
    public :
    B()
    {
        cout<<"\nSecond Constructor"<<endl;
    }
    ~B()
    {
        cout<<"\nSecond Destructor"<<endl;
    }
};
class C : public B{
    public :
    C()
    {
        cout<<"\nThird Constructor"<<endl;
    }
    ~C()
    {
        cout<<"\nThird Destructor"<<endl;
    }
};
int main()
{
    C obj;
    return 0;
}
```

OUTPUT:

```
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practicals\Prac-7> cd
 "c:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practicals\Prac-7\" ;
if ($?) { g++ PPQ7.cpp -o PPQ7 } ; if ($?) { .\PPQ7 }
First Constructor

Second Constructor

Third Constructor

Third Destructor

Second Destructor

First Destructor
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practicals\Prac-7>
```

2.
```
#include <iostream>;
using namespace std;
class Info
{
char* name;
int Number;
public:
void getInfo()
{
cout << "Info::getInfo";
getName();
}
void getName()
{
cout << "Info::getName";
}
};
class Name: public Info
{
char *name;
public:
void getName()
{
cout << "Name::getName";
}
};
void main()
{
Info *P;
```

```
Name n;
P = n;
p->getInfo();
}
```

ERRORS:

- Termination in include.
- As P is pointer it requires address.
- Syntax error in last line.

CORRECTED CODE:

```
#include <iostream>
using namespace std;
class Info
{
char* name;
int Number;
public:
void getInfo()
{
cout << "Info::getInfo";
getName();
}
void getName()
{
cout << "Info::getName";
}
};
class Name: public Info
{
char *name;
public:
void getName()
{
cout << "Name::getName";
}
};
int main()
{
Info *P;
Name n;
P = &n;
P->getInfo();
```

return 0;
}

OUTPUT:

```
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practicals\Prac-7> c
d "c:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practicals\Prac-7\"
; if ($?) { g++ PPQ7.cpp -o PPQ7 } ; if ($?) { .\PPQ7 }
Info::getInfoInfo::getName
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practicals\Prac-7>
```

3.

Find the output:

```
#include<iostream>
using namespace std;
class base {
int arr[10];
};
class b1: public base { };
class b2: public base { };
class derived: public b1, public b2 {};
int main(void)
{
cout << sizeof(derived);
return 0;
}
```

A.40

B.80

C. 0

D. 4

OUTPUT:

```
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practicals\Prac-7> c
d "c:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practicals\Prac-7\"
; if ($?) { g++ PPQ7.cpp -o PPQ7 } ; if ($?) { .\PPQ7 }
80
PS C:\Users\Admin\Google Drive\B-Tech\SEM-2\ESFP-2\ESFP-Practicals\Prac-7>
```