Topic: 1

```cpp
#include <iostream>
using namespace std;
class Test
{
public:
    int Sum(int a)
    {
        return a;
    }
    int Sum(int a, int b)
    {
        return a + b;
    }
    double Sum(double a, int b)
    {
        return a + b;
    }
    double Sum(int a, double b)
    {
        return a + b;
    }
    double Sum(double a, double b)
    {
        return a + b;
    }
};
int main()
{
    Test t;
    cout << "The Sum is " << t.Sum(10) << endl;
    cout << "The Sum is " << t.Sum(10, 20) << endl;
    cout << "The Sum is " << t.Sum(5.7, 20) << endl;
    cout << "The Sum is " << t.Sum(10, 2.6) << endl;
    cout << "The Sum is " << t.Sum(10.5, 20.7) << endl;
}
```

Topic 2

```cpp
#include <iostream>
#include <iomanip>
using namespace std;
class Circuit
{
```

```
private:
    float real, img;

public:
    Circuit(float r = 0, float i = 0)
    {
        real = r;
        img = i;
    }
    Circuit operator+(Circuit const &next)
    {
        Circuit prev;
        prev.real = real + next.real;
        prev.img = img + next.img;
        return prev;
    }
    Circuit operator-(Circuit const &next)
    {
        Circuit prev;
        prev.real = real - next.real;
        prev.img = img - next.img;
        return prev;
    }
    Circuit operator*(Circuit const &next)
    {
        Circuit prev;
        prev.real = real * next.real - img * next.img;
        prev.img = real * next.img + img * next.real;
        return prev;
    }
    Circuit operator/(Circuit const &next)
    {
        Circuit prev;
        prev.real = (real * next.real + img * next.img) / ((next.real * next.real
+ next.img * next.img));
        prev.img = (img * next.real - real * next.img) / ((next.real * next.real)
+ (next.img * next.img));
        return prev;
    }
    void print()
    {
        cout << "The Current of The Circuit is ";
        cout << real << " + i"
             << "(" << img << ")" << endl;
    }
```

```
};

int main()
{
#ifdef _WIN32
    system("cls");
#endif
#ifdef linux
    system("clear");
#endif
    Circuit z1(3, 4), z2(4, -3), z3(0, 6), z4(100, 50);
    Circuit result, eq;
    eq = ((z1 * z2 * z3) / (z1 * z2 + z2 * z3 + z3 * z1));
    result = z4 / ((z1 * z2 * z3) / (z1 * z2 + z2 * z3 + z3 * z1));
    eq.print();
    result.print();
}
```

Topic 3a

```
#include <iostream>
using namespace std;
class A
{
public:
    void print()
    {
        cout << "Inside Print() of class A" << endl;
    }
};
class B : public A
{
public:
    void print()
    {
        cout << "Inside Print() of class B" << endl;
    }
};
int main()
{
    //i)
    A a;
    a.print();
    //ii)
    B b;
    b.print();
```

```
    //iii)
    A *p;
    p = &a;
    p->print();
    //iv)
    p = &b;
    p->print();
}
```

Topic 3b

```
#include <iostream>
using namespace std;
class A
{
public:
    virtual void print()
    {
        cout << "Inside Print() of class A" << endl;
    }
};
class B : public A
{
public:
    void print()
    {
        cout << "Inside Print() of class B" << endl;
    }
};
int main()
{
    // i)
    A a;
    a.print();
    // ii)
    B b;
    b.print();
    // iii)
    A *p;
    p = &a;
    p->print();
    // iv)
    p = &b;
    p->print();
}
```

Topic 4

```cpp
#include <iostream>

using namespace std;
class A
{
public:
    virtual void print() = 0;
};
class B : public A
{
public:
    void print()
    {
        cout << "Inside Print() of class B" << endl;
    }
};
int main()
{
    // i)
    // A a;
    // a.print();
    // ii)
    B b;
    b.print();
    // iii)
    A *p;
    // p = &a;
    p->print();
    // iv)
    p = &b;
    p->print();
}
```

Topic 5

```cpp
#include <iostream>
using namespace std;
class A
{
private:
    int x;

public:
    A()
    {
```

```
        x = 0;
    }
    void display()
    {
        cout << "The final result is : = " << x << endl;
    }
    friend void Add(A &a);
    friend void Inc(A &a);
    friend void Dec(A &a);
};
void Add(A &a)
{
    cout << "Input your assigning Value : >" << endl;
    int v;
    cin >> v;
    a.x = v;
}
void Inc(A &a)
{
    cout << "Input your Increased Value : >" << endl;
    int m;
    cin >> m;
    a.x = a.x + m;
}
void Dec(A &a)
{
    cout << "Input your Decreased Value : >" << endl;
    int n;
    cin >> n;
    a.x = a.x - n;
}
int main()
{
    A s;
    Add(s);
    Inc(s);
    Dec(s);
    s.display();
}
```