1. What is the output of the following code? (10 points)

```
public class Foo {
    public static void main(String[] args) {
        int j=0;

        for (int i=0; i<10; i++) {
            j=j++;
        }

        System.out.println(j);
    }
}
```

2. Rewrite the following **for** loop as **while** loop. (10 points)

```
public class Foo {
    public static void main(String[] args) {
        for (int i = 127; i >= 0; i--) {
            System.out.println(i);
        }
    }
}
```

```
public class Foo {
    public static void main(String[] args) {
    }
}
```

3. Rewrite the following **multiway if-else** statement with one **switch** statement. (12 points)

```
public class Foo {
    public static void main(String[] args) {
        char ch = 'm';

        if (ch == 'W' || ch == 'w')
            System.out.println("Well");
        else if (ch == 'M' || ch == 'm')
            System.out.println("Macrohard");
        else if (ch == 'B' || ch == 'b')
            System.out.println("BNE");
        else
            System.out.println("Unknown");
    }
}
```

```
public class Foo {
    public static void main(String[] args) {
    }
}
```

4. What is the output of the following code. (12 points)

```
public class Foo {
    public static void main(String[] args) {
        int i=2;

        switch (i) {
            case 0:
                System.out.print("llan ");

            case 1:
                System.out.print("JiaoShi ");

            case 2:
                System.out.print("Fo ");

            case 3: word="Guang";
                System.out.print("Guang ");

            default:
                System.out.println("University.");
        }
}
```


5. What is the output of the following program? (12 points)

```
public class Foo {
    public static void main(String[] args) {
        int i=1;

        for (int i=1; i<3; i++) {
            // wasting time.
        }

        System.out.print("Fo Guang is the ");

        switch (i) {
            case 1:
                System.out.println("First!");
                break;

            case 2:
                System.out.println("Second!");
                break;

            case 3:
                System.out.println("Third!");
                break;

            default:
                System.out.println("Last!");
        }
}
```

6. Finish the definition of the class **Foo** so that it can work with the interface **Welcome** properly. (8 points)

```
public interface Welcome {
        public void sayHello();
}
```

```
public class Foo implements Welcome {
    public static void main(String[] args) {
        Foo foo=new Foo();

        foo.sayHello();
    }


}
```

7. Finish the definition of the class **Foo** so that it can work with the abstract class **AbstractFoo** properly (8 points)

```
public interface Welcome {
        public void sayHello();
}

public abstract class AbstractFoo implements Welcome {
     abstract public doNothing();

     public void sayHello() {
          System.out.println("Hello World!");
     }
}
```

```
public class Foo extends AbstractFoo {
     public static void main(String[] args) {
          Foo foo=new Foo();

          foo.sayHello();
     }

}
```

8. When compiling the following code the compiler complains for errors. Try to fix the bug by modifying the **Foo** class. (10 points)

```
public interface Welcome {
        public void sayHello();
}

public class Singleton implements Welcome {
     private static final INSTANCE=new Singleton();

     private Singleton() {
          // private constructor.
     }

     public Singleton getInstance() {
          return INSTANCE;
     }

     public void sayHello() {
          System.out.println("Hello World!);
     }
}

public class Foo {
     public static void main(String[] args) {
          Singleton foo=new Singleton(); // compiling error!
          foo.sayHello();
     }
}
```

```
public class Foo {
     public static void main(String[] args) {
                                                  }
}
```

9. What is the output of the following program? (8 points)

```
public class Foo {
    public static void main(String[] args) {
        for (int i=0; i<args.length; i++) {
            System.out.println(args[i]);
        }
    }
}
```

10. Fill in the output of the following code. (10 points)

```
public class Foo {
        public boolean isOdd(int i) {
            return ((i%2)==1);
        }

        public static void main(String[] args) {
            int[] test={0, 1, -1} ;
            Foo foo=new Foo() ;

            for (int i=0 ; i<test.length ; i++) {
                System.out.println("isOdd("+test[i]+")"+foo.isOdd(i));
            }
        }
}
```


1. What is the output of the following code? (10 points)

```
#include <iostream>
using namespace std;
int main( )
{
        int x = 17, y = 5;
        double z = 2;
        cout << x / y << endl;
        cout << x / z << endl;
        cout << static_cast<double> (x) / y << endl;
        cout << static_cast<double> (x / y) << endl;
        cout << (double) x / y << endl;
        return 0;
}
```

2. Rewrite the following **for** loop as **while** loop. (10 points)

```
#include <iostream>
using namespace std;
int main( )
{
        for (int i = 127; i >= 0; i--)  cout << i << endl;
        return 0;
}
```

```
int main( )
{

}
```

3. Rewrite the following multiway if-else statement with one switch statement. (12 points)

```
#include <iostream>
using namespace std;
int main( )
{
        char ch = 'm';
        if (ch == 'D' || ch == 'd')
                cout << "Dell" << endl;
        else if (ch == 'M' || ch == 'm')
                cout << "Microsoft" << endl;
        else if (ch == 'I' || ch == 'i')
                cout << "Intel" << endl;
        else
                cout << "Unknown" << endl;
        return 0;
}
```

```
int main( )
{

}
```

4. Rewrite the following switch statement with one multiway if-else statement. (12 points)

```
#include <iostream>
using namespace std;
int main( )
{
        int number = 5;
        switch (number)
        {
        case 1:
        case 3: cout << "Odd" << endl; break;
        case 2:
        case 4: cout << "Even" << endl; break;
        default: cout << "Unknown" << endl; break;
        }
        return 0;
}
```

int main( )
{
}

5. What is the output of the following program? (12 points)

```
#include <iostream>
using namespace std;
int main( )
{
        int i;
        const int arraySize = 3;
        int array[arraySize];
        int *ip1, *ip2;
        ip1 = array;
        ip2 = new int[arraySize];
        for (i = 0; i < arraySize; i++)
        {
                array[i] = i + 1;
                ip2[i] = i + 4;
        }
        for (i = 0; i < arraySize; i++)
                cout << ip1[i] <<  " ";
        cout << endl;
        for (i = 0; i < arraySize; i++)
                cout << *(ip2 + i) <<  " ";
        cout << endl;
        for (i = 0; i < arraySize; i++)
                array[i] += ip2[i];
        for (i = 0; i < arraySize; i++)
                cout << *(ip1 + i) <<  " ";
        cout << endl;
        for (i = 0; i < arraySize; i++)
                cout << ip2[arraySize – 1 - i] <<  " ";
        cout << endl;
        return 0;
}
```

6. What is the output of the following program? (8 points)

```
#include <iostream>
using namespace std;
template<class T>
void swapValues(T& v1, T& v2)
{
        T temp;
        temp = v1;
        v1 = v2;
        v2 = temp;
}
int main( )
{
        int one = 3, two = 7;
        double three = 4.4, four = 8.8;
        char five = 'x', six = 'y';
        long seven = 128, eight = 821;
        swapValues(one, two);
        cout << one << " " << two << endl;
        swapValues(three, four);
        cout << three << " " << four << endl;
        swapValues(five, six);
        cout << five << " " << six << endl;
        swapValues(seven, eight);
        cout << seven << " " << eight << endl;
        return 0;
}
```

7. What is the output of the following code? (8 points)

```
#include <iostream>
#include <cmath>
#include <cstdlib>
using namespace std;
int main( )
{
        double x = 4;
        double y = 2;
        double z = -2.7;
        double w = 3.1;
        cout << sqrt(x) << "  " << pow(x, y) << endl;
        cout << fabs(z) << "  " << fabs(w) << endl;
        cout << floor(z) << "  " << floor(w) << endl;
        cout << ceil(z) << "  " << ceil(w) << endl;
        return 0;
}
```

8. What is the output of the following code? (10 points)

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

class DayOfYear
{
public:
        DayOfYear(int monthValue, int dayValue)
                : month(monthValue), day(dayValue) { };
        DayOfYear() : month(1), day(1) { };
        void output();
private:
        int month;
        int day;
};
```

```
int main()
{
        const int size = 5;
        DayOfYear dataPoint[size];
        int i;
        for (i = 0; i < size; i += (size - 1))
        {
                cout.width(2);
                cout << i;
                dataPoint[i].output();
        }
        for (i = 0; i < size; i++)
                dataPoint[i] = DayOfYear(i, 2 * i);
        for (i = 0; i < size; i += 2)
        {
                cout.width(2);
                cout << i;
                dataPoint[i].output();
        }
        return 0;
}

void DayOfYear::output()
{
        cout.width(3);
        cout << month;
        cout.width(3);
        cout << day << endl;
}
```

9. What is the output of the following program? (8 points)

```
#include <iostream>
#include <vector>
using namespace std;
int main( )
{
        vector<int> v(3);
        cout << v.size( ) << endl;
        v[0] = 1;
        v[1] = 2;
        for (int i = 0; i < v.size( ); i++)
                cout << v[i] << " ";
        cout << endl;
        v.push_back(3);
        v.push_back(4);
        cout << v.size( ) << endl;
        for (int j = 0; j < v.size( ); j++)
                cout << v[j] << " ";
        cout << endl;
        return 0;
}
```

10. Fill in the output in the following Sample Dialogue. (10 points)

```
#include <iostream>
using namespace std;
int main( )
{
        int *p1, *p2, *p3, *p4, n1, n2;
        n1 = 4;
        n2 = 8;
        p1 = &n1;
        p2 = &n2;
        p3 = &n1;
        p4 = &n2;
        p1 = p2;
        *p3 = *p4;
        n2 = 6;
        cout << &n1 << " " << &n2 << endl ;
        cout << p1 << " " << p2 << endl ;
        cout << p3 << " " << p4 << endl;
        cout << *p1 << " " << *p2 << endl ;
        cout << *p3 << " " << *p4 << endl;
        cout << &(*p1) << " " << &(*p3) << endl ;
        return 0;
}
```

Sample Dialogue

0	0	1	2	F	F	6	C		0	0	1	2	F	F	6	8			

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