

Work Time: 30min

Please copy the subjects and then close your laptops.

Default (1p).

1 (3p). Given the following Java collection:

```
List<Integer> numbers = Arrays.asList(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14,15);
```

Using Java functional style (Java streams), please write a Java stream program that is doing the following operations in the following order:

- a)keep only the numbers which are either multiple of 5 or multiple of 4;**
- b) transform each remaining number into a string, that consists of a prefix "N", the number and the suffix "R"(eg. 5 is transformed into "N5R")**
- c)concatenate all the strings**

2 (3p). Given the following four classes in Java:

```
class A implements D{...}  class B extends A {...}  class C extends B {...}
```

```
class Amain{
```

```
    D method1(ArrayList<.....> list) { if list.isEmpty() return null; else return list.get(1);}
    void method2(ArrayList<.....> list, D elem) { list.add(elem);}
    void method3(C elem){
```

```
        ArrayList<A> listA=new ArrayList<A>(); listA.add(new C());listA.add(new C());
```

```
        ArrayList<B> listB = new ArrayList<B>(); listB.add(new B());listB.add(new B());
```

```
        ArrayList<C> listC = new ArrayList<C>(); listC.add(new C()); listC.add(new C());
```

```
        this.method1(listA); this.method1(listB); this.method1(listC);
```

```
        this.method2(listA,elem); this.method2(listB,elem); this.method2(listC,elem);
```

```
    }
```

```
}
```

Please complete the most specific wildcard types for the class A main methods (method1 and method2) such that the entire program is correct. Please justify your solution. If it is not possible to find a solution please explain the reason.

3 (3p). Is the following Java code correct? Please explain your answer.

```
abstract class A1 { abstract int getS1(int);}

class A extends A1 {

    static int f1;

    static int s1=0;

    public A(int a) { this.f1=a*s1;s1=s1+1; }

    static int getS() {

        A ob= new A(10);

        return ob.getS1();

    }

    int getS1() {return f1;}

}
```