

Work Time: 20min

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 2;
- b) transform each remaining number into a string, such that if the number is multiple of 5 it is transformed into "AAAAA", otherwise the number is transformed into "BBB"
- c) calculate the sum of the lengths of those strings

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

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

```
interface D {...}
```

```
class Amain{
```

```
    ... method1(... list) { return list.get(0);} 
```

```
    void method2(... list, D el) { list.add(el);} 
```

```
    void method3(A elem){
```

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

```
class A {  
    protected int f1;  
    static int s1=0;  
    public A(int a) { this.f1=a*s1;s1=s1+1; }  
    static int getS() { return getS1(f1); }  
    int getS1(int x) {return (x*getS());}  
}
```