Class : M.Sc (Theoretical Computer Science) **Semester : 5**

PSG COLLEGE OF TECHNOLOGY, COIMBATORE
DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCES
15XT56 – JAVA PROGRAMMING LAB
PROBLEM SHEET III - ARRAY OF OBJECTS

1. Create a class called `Complex` with following private field

```
int real, int imaginary
```

and following public constructor

```
Complex(int real, int imaginary)
```

and following public methods

```
void setReal(int real), int getReal(),
void setImaginary(int imaginary), int getImaginary(),
Complex add(Complex c), Complex subtract(Complex c),
Complex multiply(Complex c)
```

Create another class named `ComplexList` with following private field

```
Complex list[]
```

and following public constructor

```
ComplexList(int length)
```

and following public methods

```
void setElement(int index, Complex element)
Complex getElement(int index)
Complex calculateTotal()
```

Create an objects for `Complex` class and an object for `ComplexList` class and call `caculateTotal()` method to find the total of all complex numbers.

2. Create a class called `Polynomial` with following private field

`int a` – coefficient of x^2
`int b` – coefficient of x
`int c` – constant

and following constructor

```
Polynomial(int a, int b, int c)
```

and following public methods

```
int getA(), int getB(), int getC(), void setA(int a),
void setB(int b), void setC(int c), Polynomial add(Polynomial p)
```

Create another class named `PolynomialList` with following private field

```
Polynomial list[]
```

and following public constructor

```
PolynomialList(int length)
```

and following public methods

```
void setElement(int index, Polynomial element)
Polynomial getElement(int index)
Polynomial calculateTotal()
```

Create an objects for `Polynomial` class and an object for `PolynomialList` class and call `caculateTotal()` method to find the total of all polynomials.

3. Create a class called `Point` with following private fields

```
int x, int y
```

and following constructor

```
Point(int x, int y)
```

and following public methods

```
int getX(), int getY(), void setX(int x), void setY(int y),
double distanceFrom(Point p)
```

Create another class named `Polygon` with following private field

```
Point list[]
```

and following public constructor

```
Polygon(int pointcount)
```

and following public methods

```
void setPoint(int index, Point element)
Point getPoint(int index)
double calculateCircumference()
```

Create an objects for `Point` class and an object for `Polygon` class and call `caculateCircumference()` method to find the circumference of the polygon.

4. Create a class called `Point` with following private fields

```
int x, int y
```

and following constructor

```
Point(int x, int y)
```

and following public methods

```
int getX(), int getY(), void setX(int x), void setY(int y)
```

Create another class named `Triangle` with following private field

```
Point p1, p2, p3
```

and following public constructor

```
Triangle(Point p1, Point p2, Point p3)
```

and following public methods

```
void setP1(Point element),    Point getP1()
void setP2(Point element),    Point getP2()
void setP3(Point element),    Point getP3()
double calculateCircumference(),   double calculateArea()
```

Create three objects for `Point` class and an object for `Triangle` class and call `caculateCircumference()`, `calculateArea()` methods to find the circumference and area of the triangle.