**A - Iteration - Predict Loop Output (1 point each)**

**1. for (int i = 1; i < 10; i++) { if (i % 2 == 1) { System.out.print(i + " "); } }**

**Output - 1 3 5 7 9**

**2. double x = 1; double y = 1; int i = 0; do { y = y / 2; x = x + y; i++; } while (x < 1.75); System.out.print(i + " ");**

**Output - 2**

**3. double x = 1; double y = 1; int i = 0; while (y <= 1.5) { x = x / 2; y = x + y; i++; } System.out.print(i + " ");**

**Output - 2**

**B - Iteration - Write a method or program requiring iteration**

**Question 1 - Class Design – Particle (2 points)**

**Answer the following questions for the problem. Type your answers in the text box:**

**1. What are the instance attributes, their data types and valid ranges?**

**2. What are instance methods needed, their arguments and return types?**

**3. What are the class constants needed, their data type and value?**

1. **Instance attributes are - a,b,c,d ( All in Double Data Type ) . Also possible to write location, velocity,initialLocation, but i would prefer writing them inside of the method, which would make them local. Attributes should be private because they should not be accessed by users.**
2. **For the methods we would write:**

**Constructor, Accessors, Mutators, toString method, getTable**

**Constructor should be non-default only.**

**public Particle(double numA, double numB, double numC, double numD){ a = numA; b = numB; c = numC; d = numD; }**

**For accessors we would write getA(), getB(), getC(), getD() and we would return the value of the letter. All of the accessors should be in double format ( data type ) . Here is an example of one of the getters :**

**public double getA() { return a; } and same goes for getB(),getC(), and getD();**

**For mutators we would write setA(), setB(), setC(), setD(). And we would set the value of the variable we need to the needed one.We would not have return type for mutators which is why we write void. On of the examples could be seen below:**

**public void setD(double numD){ d = numD; } and we do similarly for setA(), setB() , and setC() .**

**toString method would be in the given format :**

**public String toString() { return "location(t) = " + a+"t^4"+"+"+b+"t^3"+"+"+c+"t^2+"+d+"t"; }**

**For getTable we would pass starting point , ending point and the increment. Then we should create an iteration and return the multiline with the different values. Code could be seen in file Particle.java .**

**3 For this class we would have 1 must-have constant variable which is related to formatting :**

**private static final DecimalFormat DECIMALPLACES . We need this constant, so we format our output values to 3 decimal places.**

**OPTIONAL**

**Also it is optional to write the multipliers to calculate velocity. So instead of writing 4\*a … , we can create constant for 4, for example private static final double NUM1 = 4 and same for 3,2**