Tutorial #9: Introduction to Classes

Question 1:

Assume the following class that represents a playing card.

```
public class PlayingCard
{
   private int value; // ex. 1 (ace) to 13 (king)
   private String color; // ex: "heart" "diamond" "club" "spade"

   public void writeOutput()
   {
      System.out.println(value + " of " + color);
   }
   public void randomCard()
   {
      value = (int)(Math.random()*13)+1;// a random integer between [1..13]
      switch ((int)(Math.random()*4)+1) // a random integer between [1..4]
      {
        case 1: color = "heart"; break;
        case 2: color = "diamond"; break;
        case 3: color = "spade"; break;
        case 4: color = "club"; break;
      }
   }
   public int isAFace()
   {
      // is the value a jack (11), a queen (12) or a king (13)?
      return (value == 11 || 12 || 13
   }
   public boolean isAnAce()
   {
      return (PlayingCard.value == 1);
   }
}
```

And assume the following driver:

```
public class CardDriver{
	public static void main(String[] args)
	{
		PlayingCard mySecondCard = new PlayingCard();
		mySecondCard.randomCard();
		boolean answer = isAnAce();
		do
		{
			mySecondCard = randomCard();
			System.out.println(mySecondCard.isAFace());
			System.out.println(mySecondCard.writeOutput);
		}while (mySecondCard.isAFace());
	}
}
```

A.

Name all the objects of the class `PlayingCard.`

B.

Name all the methods of the class `PlayingCard.`

C.

The class and the driver program contain several syntax errors. Identify and correct them.

Question 2:

Given the following class definition

```
public class Question {
private int gradeQ1;
private int gradeQ2;
private int gradeQ3;
private int total;
public void computeTotal(){
…
}
public int returnTotal(){
…
}
public void printTotal(){
…
}
public boolean getQuestionRight(){
…
}
}
```

1. How many states does an object of type class have and what are their names?

2. Write down the complete header of one of the methods of class `Question`?

3. What is the return type of the method `computeTotal()`?

4. What is the return type of the method `getQuestionRight()`?

5. Complete the method `computeTotal()` so that it calculates the total score (sum of `gradeQ1`, `gradeQ2` and `gradeQ3`) and assigns it to the attribute `total`.

6. Complete the method `returnTotal()` which returns the total score.

7. Complete the method `printTotal()` which displays the total score along with a descriptive message.

Question 3:

Consider the following class:

```
public class AClass {
     private int a;
     public int b;

     public AClass() {
      a = 10;
      b = 10;
     }

     private void increment() {
      increment(1);
     }

     public void increment(int i) {
      a+= i;
      b+= i;
     }
}
```

and the following declaration in the driver class:

```
AClass obj1 = new AClass();
```

Indicate if the following instructions will cause a syntax error if they are placed in the driver class after the above declaration. If there is an error, briefly explain why.

```
a) System.out.print(obj1);


b) AClass.increment(5+5);


c) System.out.print(obj1.a);


d) System.out.print(obj1.b);
```