Objectives
- Creating a Class
- Attributes , methods of the Class
- Data Element Class
- Driver Class

Concept Questions

1) A class specifies the _____ and _____ that a particular type of object has.
A) relationships; methods
B) fields; object names
C) fields; methods
D) relationships; object names

2) One or more objects may be created from a(n):
A) field
B) class
C) method
D) instance

3) Class objects normally have _____ that perform useful operations on their data(attributes).

A) fields
B) instances
C) methods
D) relationships

4) Which of the following are classes from the Java API?
A) `Scanner`
B) `Random`
C) `PrintWriter`
D) All of the above

5) Data hiding, which means that critical data stored inside the object is protected from code outside the object, is accomplished in Java by:
A) using the `public` access specifier on the class methods
B) using the `private` access specifier on the class methods
C) using the `private` access specifier on the class definition

D) using the `private` access specifier on the class fields

6) For the following code, which statement is NOT true?

```
public class Sphere
{
    private double radius;
    public double x;
    private double y;
    private double z;
}
```
A) `x` is available to code that is written outside the `Sphere` class.
B) `radius` is not available to code written outside the `Sphere` class.
C) `radius`, `x`, `y`, and `z` are called members of the `Sphere` class.
D) `z` is available to code that is written outside the `Sphere` class.

7) Methods that operate on an object's fields are called:
A) instance variables
B) instance methods
C) public methods
D) private methods

8) The scope of a `private` instance field is:
A) the instance methods of the same class
B) inside the class, but not inside any method
C) inside the parentheses of a method header
D) the method in which they are defined

9) It is common practice in object-oriented programming to make all of a class's:
A) methods private
B) fields private
C) fields public
D) fields and methods public

10) How can you find out if `DecimalFormat` is a Java API class or not?

11) Write a `set` and `get` method for the `radius` attribute of the following `Sphere` class.

```
public class Sphere
{
    private double radius;
```

```
    public double x;
    private double y;
}
```

12) What happens if you don't create a constructor for a class?
A) Java won't compile the program
B) Java creates a default constructor
C) Java displays a warning
D) Nothing

13) Write a java statement based on the following class definition to create a new instance of the `Tree` class where the species is of type "elm"?

```
public class Tree {
    String species;
    public Tree (String species)
    {
        this.species = species;
    }
}
```

14) Following code has compilation error. Why?

```
public class Cards {
    String suites;
    public Card (String suites)
    {
        this.suites = suites;
    }
}
```

15) Following is the declaration of the class Cards.

```
public class Cards {
    String suit;
    public void Cards(String suit)
    {
        this.suit = suit;
    }
```

```java
    public String getSuit()
    {
        return suit;
    }
}
```

What is the output of the following code?

```java
Cards c1 = new Cards ("Heart");
System.out.println(c1.getSuit());
```

Programming Questions

1) Write java code to define a class called Person (Your Data Element class) with the following information:

<u>Fields</u>
- name (String)
- lastName(String)
- age (int)

<u>Methods of the `Person` Class</u>
- `fullName`: this method does not take any parameter and it will return the full name of the a `Person's` object as a `String` value. For example if there is a `p1` Person object where the `name` field is `john` and the `lastName` field is `smith` then calling the method `fullName` for `p1` object should return `john smith`.

- `ageAfterTenYears`: this method does not take any parameter and it returns the age of a `Person's` object after 10 years. For example if there is a `p1 Person` object where the `age` field is `20` then calling the method `ageAfterTenYears` for `p1` object should return `30`.

- Create setter and getter methods for all the fields of the `Person` Class.

Test your `Persons` class with the following driver class and `WRITECODE` on the highlighted area shown below:

```java
public class PersonDriver {

    public static void main(String[] args) {

        //Create a person object
        Person emily = new Person();
        //set name
        emily.setName("Emily");
        //set name
```

```java
emily.setLastName("Smith");
emily.setAge(25);
//Display the name for emily
System.out.println( emily.getName());
//Write code to display the full name for emily
System.out.println( emily.fullName());
//Write code to display the the age after ten years
System.out.println( emily.ageAfterTenYears());

/*WRITE CODE:
  create another object called bob with name "Bobby" and age 34.
  Call the similar methods for bob object and observe the results.
  What will be displayed for the full name of bob object? Why?
*/
    }

}
```