Java Name –
Classes Objects AP Style Worksheet #2 Period –

Multiple Choice – Circle your answer on this paper AND fill in the Scantron form.

1. As we have studied so far, a regular class such as `Bug` has _____ while a client program usually doesn't have _____ .
a. a `main` method
b. a default constructor
c. an IDE
d. at least one `String` variable

2.
```
public class Human
{
   private String myGender;
   private int myAge;
   private double myWeight;
   private Position myPosition;     // position (x, y) in world
   private int myHealth;            // 0 (dead) to 100 (healthy)
   . . .
```

Given the partial `Human` class above, which method is the **best candidate** for being a static method?
a. `averageLifeExpectancy // returns average age of death`
b. `goOnDiet // human exercises and loses weight`
c. `getAge // returns age of human`
d. `celebrateBirthday // human ages one year`

3. Which of the following statements about objects is **true**?
a. Every object belongs to a class
b. Only one object variable can be instantiated in a client class
c. An object usually has private methods
d. Public methods are hidden from client programmers
e. An accessor method begins with the prefix `set`

4. Which of the following statements about a constructor is **false**?
a. a default constructor has no parameters
b. a constructor does not return a value
c. a default constructor must be implemented by the class developer in every class
d. it is possible to have more than one constructor with parameters in a class

5. Another term for a property is
a. an object variable b. an attribute c. a constructor d. an instantiator e. an object reference

6. An object stores its state in
a. reference variables b. constructors c. `double` variables d. instance fields e. a `String`

7. Consider the following three method headers.
I. `double doSomething(String a, int b)`
II. `int doSomething(String name, int num)`
III. `double doSomething(int b, String a)`

Which of the following statements is true about their method signatures?
a. I and II have the same method signature and this signature is different from the method signature of III.
b. II and III have the same method signature and this signature is different from the method signature of I.
c. I and III have the same method signature and this signature is different from the method signature of II.
d. I, II, and III all have the same method signature.
e. I, II, and III all have different method signatures.

8. Suppose a `Bug` class has the following properties.

```
private double myAge;          // age in months
private double myWeight;       // weight in grams
```

What is true about the initialization of the properties?
a. The properties must be initialized in the constructor. If they are not, there will be a compile-time error.
b. The properties must be initialized in the constructor. If not, the program will compile but there will be a run-time error when the `Bug` object constructor is called.
c. The properties should be initialized in the constructor. If not, they will automatically be initialized to `0`.
d. The properties should be initialized in the constructor. If not, they will be automatically be initialized to `null`.

9. If two methods have the same name but different parameter lists, then….
a. it is an example of overloading.
b. an error occurs.
c. aliasing occurs.
d. there are two valid copies of the same method.

10. Which of the following statements about objects and classes is **not** true?
a. Object references are stored in object variables.
b. If it is not initialized in a client program, an object variable is automatically set equal to `null`.
c. An object reference is the memory address of an object.
d. Each object variable stores its own unique memory address unless they are aliased.
e. A class allows a programmer to instantiate instance fields.

For the following exercises, consider the `BankAccount` class whose incomplete definition is shown below.

```
// A bank account has a balance that can be changed by deposits
public class BankAccount
{
	public BankAccount()
	{
		myBalance = 0;
	}
	public BankAccount(double initialBalance)
	{
		myBalance = initialBalance;
	}
	public void deposit(double amount)
	{
		double newBalance = myBalance + amount;
		myBalance = newBalance;
	}
	public double getBalance()
	{
		return myBalance;
	}
	private double myBalance;
}
```

11. Suppose the following statements are executed in a client program:

```
BankAccount b1 = new BankAccount(500);
BankAccount b2 = new BankAccount();
b1.deposit(b2.getBalance());
b2.deposit(b1.getBalance());
```

What are the balances of `b1` and `b2` after the code is executed?
a. `b1` has balance = 500, `b2` has balance = 500
b. `b1` has balance = 1000, `b2` has balance = 500
c. `b1` has balance = 500, `b2` has balance = 1000
d. `b1` has balance = 1000, `b2` has balance = 1500
e. an error occurs

12. Suppose the following statements are executed in a client program:

```
BankAccount b3 = new BankAccount(500);
BankAccount b4 = b3;
b4.deposit(100);
```

What are the balances of `b3` and `b4` after the code is executed?
a. `b3` has balance = 500, `b4` has balance = 0
b. `b3` has balance = 600, `b4` has balance = 600
c. `b3` has balance = 600, `b4` has balance = 500
d. `b3` has balance = 600, `b4` has balance = 100
e. an error occurs

13. Suppose the following statements are executed in a client program:

```
BankAccount b3 = new BankAccount(500);
BankAccount b4 = b3;
b3 = null;
b4.deposit(b4.getBalance());
```

Which statement is true?
a. `b3` has balance = 500
b. `b4` has balance = 500
c. `b4` has balance =1000
d. `b4` has balance = 0
e. an error occurs

14. Suppose the following statements are executed in a client program:

```
BankAccount b5 = new BankAccount(200);
BankAccount b6 = b5;
b5 = null;
b6.deposit(100);
```

What are the balances of `b5` and `b6` after the code is executed?
a. `b6` has balance = 0
b. `b6` has balance = 200
c. `b6` has balance = 300
d. `b6` has balance = 500
e. an error occurs

For the following exercises, consider the following `Time` class shown below.

```
public class Time
{
   public Time() { /* implementation not shown */ }

   public Time(int h, int m, int s) { /* implementation not shown */ }

   // resets time to myHrs = h, myMins = m, mySecs = s
   public void resetTime(int h, int m, int s) { /* implementation not shown */ }

   // advances time by one second
   public void increment(){ /* implementation not shown */ }

   // returns 1 if this time is earlier than t, returns 0 otherwise
   public int lessThan(Time t) { /* implementation not shown */ }

   // returns number of hours in a day for any Time object
   public static int hoursInADay() { /* implementation not shown */ }

   public int getSecs() { /* implementation not shown */ }

   private int myHrs;
   private int myMins;
   private int mySecs;
 }
```

15. Which of the following is a **false** statement about the methods?

a. There are no static methods in this class.
b. `resetTime()` is not a constructor.
c. `Time()` is a default constructor.
d. `h` is used as the name of a formal parameter.
e. All of the statements are true.

16. Which of the following represents correct implementation for the constructor with parameters in the `Time` class above?

a.
```
myHrs = 0;
```
b.
```
myHrs = h;
myMins = m;
mySecs = s;
```
c.
```
resetTime(s, m, h);
```
d.
```
h = 0;
m = 0;
s = 0;
```
e.
```
Time = new Time(h, m, s);
```

17. Which of the following are correct implementations for the `increment` method?

I.
```
mySecs = mySecs + 1;
```
II.
```
getSecs = getSecs() + 1;
```
III.
```
this.mySecs = this.mySecs + 1;
```

a. I only
b. II only
c. III only
d. I and III only
e. I, II, and III