Practice Questions for Chapter 9

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) An object is an instance of a _____.   1) _____
    A) program   B) method   C) class   D) data

2) _____ is invoked to create an object.   2) _____
    A) A constructor   B) A method with the void return type
    C) A method with a return type   D) The main method

3) Which of the following statements are true?   3) _____
    A) Constructors must have the same name as the class itself.
    B) Multiple constructors can be defined in a class.
    C) Constructors are invoked using the new operator when an object is created.
    D) Constructors do not have a return type, not even void.

4) What is wrong in the following code?   4) _____

```
class TempClass {
  int i;
  public void TempClass(int j) {
    int i = j;
  }
}

public class C {
  public static void main(String[] args) {
    TempClass temp = new TempClass(2);
  }
}
```

    A) The program has a compilation error because TempClass does not have a constructor with an int argument.
    B) The program compiles and runs fine.
    C) The program compiles fine, but it does not run because class C is not public.
    D) The program has a compilation error because TempClass does not have a default constructor.

5) Variables that are shared by every instances of a class are _____.   5) _____
    A) public variables   B) instance variables
    C) private variables   D) class variables

6) Analyze the following code.

```
public class Test {
  int x;

  public Test(String t) {
    System.out.println("Test");
  }

  public static void main(String[] args) {
    Test test = new Test();
    System.out.println(test.x);
  }
}
```

   A) The program has a compile error because Test does not have a default constructor.
   B) The program has a compile error because x has not been initialized.
   C) The program has a compile error because you cannot create an object from the class that defines the object.
   D) The program has a compile error because System.out.println method cannot be invoked from the constructor.

7) What is the printout of the third println statement in the main method?

```
public class Foo {
  int i;
  static int s;

  public static void main(String[] args) {
    Foo f1 = new Foo();
    System.out.println("f1.i is " + f1.i + " f1.s is " + f1.s);
    Foo f2 = new Foo();
    System.out.println("f2.i is " + f2.i + " f2.s is " + f2.s);
    Foo f3 = new Foo();
    System.out.println("f3.i is " + f3.i + " f3.s is " + f3.s);
  }

  public Foo() {
    i++;
    s++;
  }
}
```

   A) f3.i is 3 f3.s is 1
   B) f3.i is 1 f3.s is 3
   C) f3.i is 1 f3.s is 2
   D) f3.i is 3 f3.s is 3
   E) f3.i is 1 f3.s is 1

8) A method that is associated with an individual object is called _____.
   A) an object method   B) an instance method
   C) a static method   D) a class method

9) Analyze the following code.

```
public class Test {
  int x;

  public Test(String t) {
    System.out.println("Test");
  }

  public static void main(String[] args) {
    Test test = null;
    System.out.println(test.x);
  }
}
```

A) The program has a compile error because you cannot create an object from the class that defines the object.
B) The program has a compile error because test is not initialized.
C) The program has a runtime NullPointerException because test is null while executing test.x.
D) The program has a compile error because x has not been initialized.
E) The program has a compile error because Test does not have a default constructor.

10) Suppose the xMethod() is invoked from a main method in a class as follows, xMethod() is _____ in the class.

```
public static void main(String[] args) {
  xMethod();
}
```

A) a static method or an instance method
B) a static method
C) an instance method

11) Analyze the following code and choose the best answer:

```
public class Foo {
  private int x;

  public static void main(String[] args) {
    Foo foo = new Foo();
    System.out.println(foo.x);
  }
}
```

A) Since x is defined in the class Foo, it can be accessed by any method inside the class without using an object. You can write the code to access x without creating an object such as foo in this code.
B) You cannot create a self-referenced object; that is, foo is created inside the class Foo.
C) Since x is private, it cannot be accessed from an object foo.
D) Since x is an instance variable, it cannot be directly used inside a main method. However, it can be accessed through an object such as foo in this code.

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12) What is the printout for the first statement in the main method?   12) _____

```java
public class Foo {
    static int i = 0;
    static int j = 0;

    public static void main(String[] args) {
        int i = 2;
        int k = 3;
        {
            int j = 3;
            System.out.println("i + j is " + i + j);
        }

        k = i + j;
        System.out.println("k is " + k);
        System.out.println("j is " + j);
    }
}
```

   A) i + j is 22   B) i + j is 23   C) i + j is 5   D) i + j is 6

13) Which of the following are properties of a constructor?   13) _____
       A) A constructor is called using the new operator.
       B) A constructor must have the same name as the class.
       C) Constructors may be overloaded.

14) Analyze the following code: 14) _____

```java
class Test {
    private double i;

    public Test(double i) {
        this.t();
        this.i = i;
    }

    public Test() {
        System.out.println("Default constructor");
        this(1);
    }

    public void t() {
        System.out.println("Invoking t");
    }
}
```

   A) this.i may be replaced by i.
   B) this(1) must be called before System.out.println("Default constructor").
   C) this(1) must be replaced by this(1.0).
   D) this.t() may be replaced by t().

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15) Java assigns a default value to a data member of a class if the data is not initialized.   15) _____
   A) true   B) false

16) Given the declaration Circle[] x = new Circle[10], which of the following statement is most   16) _____
   accurate?
   A) x contains a reference to an array and each element in the array can hold a reference to a
      Circle object.
   B) x contains an array of ten objects of the Circle type.
   C) x contains an array of ten int values.
   D) x contains a reference to an array and each element in the array can hold a Circle object.

17) What is the printout for the first statement in the main method?   17) _____

```
public class Test {
  private int i = 0;
  static int j = 0;

  public static void main(String[] args) {
    new Test();
  }

  public Test() {
    i++;
    j++;
    int i = 1;
    int j = 1;
    System.out.println("i is " + j + " j is " + j);
  }
}
```

   A) i is 1 j is 0   B) i is 1 j is 1   C) i is 0 j is 0   D) i is 2 j is 2   E) i is 0 j is 1