Practice for Chapter 11

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

1) Object-oriented programming allows you to derive new classes from existing classes. This is called _____.

    A) inheritance   B) generalization   C) encapsulation   D) abstraction

1) _____

2) Which of the following statements are true?
    A) A subclass is usually extended to contain more functions and more detailed information than its superclass.
    B) A subclass is a subset of a superclass.
    C) "class A extends B" means B is a subclass of A.
    D) "class A extends B" means A is a subclass of B.

2) _____

3) Analyze the following code:

```
public class Test extends A {
  public static void main(String[] args) {
    Test t = new Test();
    t.print();
  }
}

class A {
  String s;

  A(String s) {
    this.s = s;
  }

  public void print() {
    System.out.println(s);
  }
}
```

    A) The program would compile if a default constructor A(){ } is added to class A explicitly.
    B) The program compiles, but it has a runtime error due to the conflict on the method name print.
    C) The program has an implicit default constructor Test(), but it cannot be compiled, because its super class does not have a default constructor. The program would compile if the constructor in the class A were removed.
    D) The program does not compile because Test does not have a default constructor Test().

3) _____

4) Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    B b = new B();
    b.m(5);
    System.out.println("i is " + b.i);
  }
}

class A {
  int i;

  public void m(int i) {
    this.i = i;
  }
}

class B extends A {
  public void m(String s) {
  }
}
```

A) The program has a compilation error, because b.m(5) cannot be invoked since the method m(int) is hidden in B.
B) The method m is not overridden in b. B inherits the method m from A and defines an overloaded method m in b.
C) The program has a compilation error, because m is overridden with a different signature in B.
D) The program has a runtime error on b.i, because i is not accessible from b.

5) Analyze the following code:

```java
public class Test {
  public static void main(String[] args) {
    new B();
  }
}

class A {
  int i = 7;

  public A() {
    System.out.println("i from A is " + i);
  }

  public void setI(int i) {
    this.i = 2 * i;
  }
}

class B extends A {
  public B() {
    setI(20);
    // System.out.println("i from B is " + i);
  }

  public void setI(int i) {
    this.i = 3 * i;
  }
}
```

A) The constructor of class A is not called.
B) The constructor of class A is called and it displays "i from A is 60".
C) The constructor of class A is called and it displays "i from A is 7".
D) The constructor of class A is called and it displays "i from A is 40".

6) Which of the following statements are true?

A) It is a compilation error if two methods differ only in return type in the same class.
B) To override a method, the method must be defined in the subclass using the same signature and compatible return type as in its superclass.
C) A static method cannot be overridden. If a static method defined in the superclass is redefined in a subclass, the method defined in the superclass is hidden.
D) A private method cannot be overridden. If a method defined in a subclass is private in its superclass, the two methods are completely unrelated.
E) Overloading a method is to provide more than one method with the same name but with different signatures to distinguish them.

7) What is the output of the following code?

```
public class Test {
    public static void main(String[] args) {
        new Person().printPerson();
        new Student().printPerson();
    }
}

class Student extends Person {
    public String getInfo() {
        return "Student";
    }
}

class Person {
    public String getInfo() {
        return "Person";
    }

    public void printPerson() {
        System.out.println(getInfo());
    }
}
```

A) Person Student   B) Person Person
C) Stduent Student   D) Student Person

8) Composition means _____.   8) _____
   A) that a class extends another class
   B) that a variable of supertype refers to a subtype object
   C) that a class contains a data field that references another object
   D) that data fields should be declared private

9) Inheritance means _____.   9) _____
   A) that a class can contain another class
   B) that a variable of supertype can refer to a subtype object
   C) that a class can extend another class
   D) that data fields should be declared private

10) Encapsulation means _____.   10) _____
   A) that data fields should be declared private
   B) that a variable of supertype can refer to a subtype object
   C) that a class can extend another class
   D) that a class can contain another class

11) Polymorphism means _____.   11) _____
   A) that a class can extend another class
   B) that data fields should be declared private
   C) that a variable of supertype can refer to a subtype object
   D) that a class can contain another class

12) Which of the following classes cannot be extended?   12) _____
    A) final class A { }   B) class A { }
    C) class A {   protected A();}   D) class A {   private A();}

13) Which statements are most accurate regarding the following classes?   13) _____

```
class A {
  private int i;
  protected int j;
}

class B extends A {
  private int k;
  protected int m;
}
```

    A) An object of B contains data fields j, m.
    B) An object of B contains data fields i, j, k, m.
    C) An object of B contains data fields k, m.
    D) An object of B contains data fields j, k, m.

14) What modifier should you use on the members of a class so that they are not accessible to another   14) _____
class in a different package, but are accessible to any subclasses in any package?
    A) private   B) Use the default modifier.
    C) public   D) protected

15) What modifier should you use on a class so that a class in the same package can access it but a class   15) _____
in a different package cannot access it?
    A) public   B) protected
    C) Use the default modifier.   D) private

16) Invoking _____ returns the number of the elements in an ArrayList x.   16) _____
    A) x.length(1)   B) x.getLength(0)   C) x.size()   D) x.getSize()

17) You can create an ArrayList using _____.   17) _____
    A) ArrayList()   B) new ArrayList[]
    C) new ArrayList[100]   D) new ArrayList()

18) What is the output of the following code?   18) _____

```
public class Test {
  public static void main(String[] args) {
    Object o1 = new Object();
    Object o2 = new Object();
    System.out.print((o1 == o2) + " " + (o1.equals(o2)));
  }
}
```

    A) true true   B) true false   C) false true   D) false false

19) Given the following code:

```
class C1 {}
class C2 extends C1 { }
class C3 extends C2 { }
class C4 extends C1 {}

C1 c1 = new C1();
C2 c2 = new C2();
C3 c3 = new C3();
C4 c4 = new C4();
```

Which of the following expressions evaluates to false?
A) c2 instanceof C1	B) c4 instanceof C2
C) c3 instanceof C1	D) c1 instanceof C1

20) Given the following classes and their objects:

```
class C1 {};
class C2 extends C1 {};
class C3 extends C1 {};

C2 c2 = new C2();
C3 c3 = new C3();
```

Analyze the following statement:

```
c2 = (C2)((C1)c3);
```

A) You will get a runtime error because you cannot cast objects from sibling classes.
B) You will get a runtime error because the Java runtime system cannot perform multiple casting in nested form.
C) c3 is cast into c2 successfully.
D) The statement is correct.

21) Which of the following are Java keywords?
A) cast	B) casting	C) instanceof	D) instanceOf