

Chapter 6

Working with Methods and Encapsulation

THE OCA EXAM TOPICS COVERED IN THIS PRACTICE TEST INCLUDE THE FOLLOWING:

✓ **Working with Methods and Encapsulation**

- Create methods with arguments and return values; including overloaded methods
- Apply the static keyword to methods and fields
- Create and overload constructors; differentiate between default and user defined constructors
- Apply access modifiers
- Apply encapsulation principles to a class
- Determine the effect upon object references and primitive values when they are passed into methods that change the values

1. Fill in the blanks: The_____ access modifier allows access to everything the _____access modifier does and more.
 - A. package-private, protected
 - B. protected, public
 - C. protected, package-private
 - D. private, package-private
2. What is the command to call one constructor from another constructor in the same class?
 - A. `super()`
 - B. `this()`
 - C. `that()`
 - D. `construct()`
3. What is the output of the following application?

```
package stocks;
public class Bond {
    private static int price = 5;
    public boolean sell() {
        if(price<10) {
            price++;
            return true;
        } else if(price>=10) {
            return false;
        }
    }
    public static void main(String[] cash) {
        new Bond().sell();
        new Bond().sell();
        new Bond().sell();
        System.out.print(price);
    }
}
```

- A. 5
 - B. 6
 - C. 8
 - D. The code does not compile.
4. What is true about the following program?

```
package figures;
public class Dolls {
```

```

public void nested() { nested(2,true); } // g1
public int nested(int level, boolean height) { return nested(level); }
public int nested(int level) { return level+1; }; // g2

public static void main(String[] outOfTheBox) {
    System.out.print(new Dolls().nested());
}
}

```

- A. It compiles successfully and prints 3 at runtime.
 - B. It does not compile because of line g1.
 - C. It does not compile because of line g2.
 - D. It does not compile for some other reason.
5. Fill in the blank: Java uses _____ to send data into a method.
- A. pass-by-null
 - B. pass-by-value
 - C. both pass-by-value and pass-by-reference
 - D. pass-by-reference
6. Which of the following is a valid JavaBean method signature?
- A. `public void getArrow()`
 - B. `public void setBow()`
 - C. `public void setRange(int range)`
 - D. `public String addTarget(String target)`
7. Which of the following statements about calling `this()` in a constructor is not true?
- A. If `this()` is used, it must be the first line of the constructor.
 - B. If `super()` and `this()` are both used in the same constructor, `super()` must appear on the line immediately after `this()`.
 - C. If arguments are provided to `this()`, then there must be a constructor in the class able to take those arguments.
 - D. If the no-argument `this()` is called, then the class must explicitly implement the no-argument constructor.
8. Which of the following can fill in the blank to make the class compile?

```

package ai;
public class Robot {
    _____ compute() { return 10; }
}

```

- A. `Public int`

- B. Long
- C. void
- D. private String

9. Fill in the blank: A _____ variable is always available to all instances of the class.

- A. public
- B. local
- C. static
- D. instance

10. Which line of code, inserted at line p1, causes the application to print 5?

```
package games;
public class Jump {
    private int rope = 1;
    protected boolean outside;
    public Jump() {
        // p1
        outside = true;
    }
    public Jump(int rope) {
        this.rope = outside ? rope : rope+1;
    }
    public static void main(String[] bounce) {
        System.out.print(new Jump().rope);
    }
}
```

- A. this(4);
- B. new Jump(4);
- C. this(5);
- D. rope = 4;

11. Which of the following statements is not true?

- A. An instance of one class may access an instance of another class's attributes if it has a reference to the instance and the attributes are declared `public`.
- B. An instance of one class may access package-private attributes in a parent class, provided the parent class is not in the same package.
- C. Two instances of the same class may access each other's `private` attributes.
- D. An instance of one class may access an instance of another class's attributes if both classes are located in the same package and marked `protected`.

12. Given the following class, what should be inserted into the two blanks to ensure the

class data is properly encapsulated?

```
package storage;
public class Box {
    public String stuff;
    _____String_____ () {
        return stuff;
    }

    public void setStuff(String stuff) {
        this.stuff = stuff;
    }
}
```

- A. public **and** getStuff
- B. private **and** isStuff
- C. public **and** setStuff
- D. None of the above

13. Which statement about a no-argument constructor is true?

- A. The Java compiler will always insert a default no-argument constructor if you do not define a no-argument constructor in your class.
- B. In order for a class to call `super()` in one of its constructors, its parent class must explicitly implement a no-argument constructor.
- C. If a class extends another class that has only one constructor that takes a value, then the child class must explicitly declare at least one constructor.
- D. A class may contain more than one no-argument constructor.

14. Which of the following method signatures does not contain a compiler error?

- A. `public void sing(String key, String... harmonies)`
- B. `public void sing(int note, String... sound, int music)`
- C. `public void sing(String... keys, String... pitches)`
- D. `public void sing(String... notes, String melodies)`

15. Given the following application, which diagram best represents the state of the `mySkier`, `mySpeed`, and `myName` variables in the `main()` method after the call to the `slalom()` method?

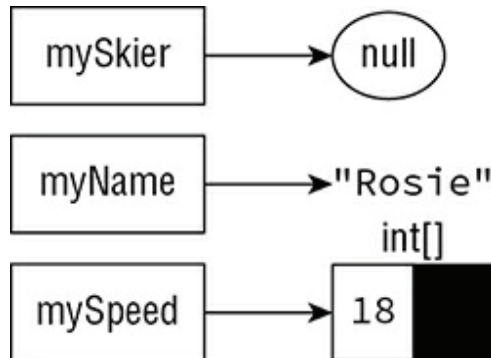
```
package slopes;
public class Ski {
    private int age = 18;
    private static void slalom(Ski racer, int[] speed, String name) {
        racer.age = 18;
        name = "Wendy";
        speed = new int[1];
        speed[0] = 11;
    }
}
```

```

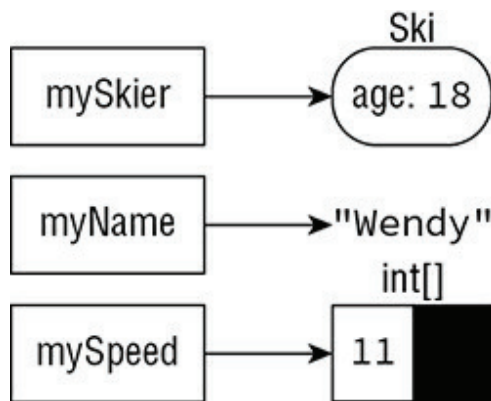
    racer = null;
}
public static void main(String... mountain) {
    final Ski mySkier = new Ski();
    mySkier.age = 16;
    final int[] mySpeed = new int[1];
    final String myName = "Rosie";
    slalom(mySkier, mySpeed, myName);
}
}

```

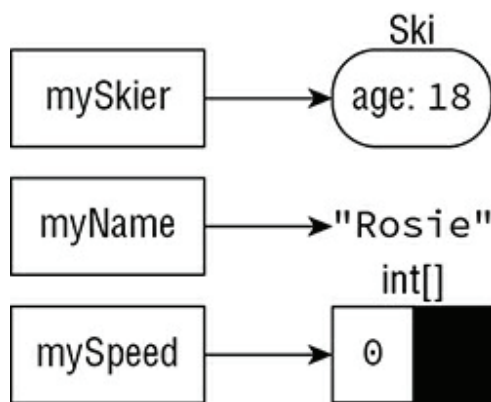
A.



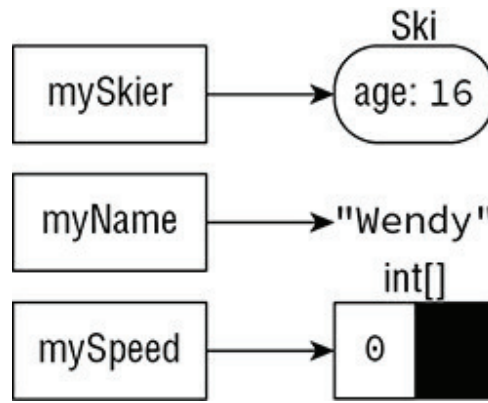
B.



C.



D.



16. Given the class below, which method signature could be successfully added to the class as an overloaded version of the `findAverage()` method?

```
public class Calculations {
    public Integer findAverage(int sum) { return sum; }
}
```

- A. `public Long findAverage(int sum)`
 - B. `public Long findAverage(int sum, int divisor)`
 - C. `public Integer average(int sum)`
 - D. `private void findAverage(int sum)`
17. Which of the following is not a reason to use encapsulation when designing a class?
- A. Promote usability by other developers.
 - B. Maintain class data integrity of data elements.
 - C. Prevent users from modifying the internal attributes of a class.
 - D. Increase concurrency and improve performance.
18. Which of the following data types can be modified after they are passed to a method as an argument?

- A. `int[]`
- B. `String`
- C. `long`
- D. `boolean`

19. What is the best way to call the following method from another class in the same package, assuming the class using the method does not have any `static` imports?

```
package useful;
public class MathHelper {
    public static int roundValue(double d) {
        // Implementation omitted
    }
}
```

- A. `MathHelper:roundValue(5.92)`
- B. `MathHelper.roundValue(3.1)`
- C. `roundValue(4.1)`
- D. `useful.MathHelper.roundValue(65.3)`

20. Given a method with one of the following return types, which data type prevents the `return` statement from being used within the method?

- A. `byte`
- B. `String`
- C. `void`
- D. None of the above

21. How many `final` modifiers would need to be removed for this application to compile?

```
package end;
public final class Games {
    public final static int finish(final int score) {
        final int win = 3;
        final int result = score++ < 5 ? 2 : win;
        return result+=win;
    }
    public static void main(final String[] v) {
        System.out.print(finish(Integer.parseInt(v[0])));
    }
}
```

- A. None
- B. One
- C. Two
- D. The code will not compile regardless of the number of `final` modifiers that are removed.

22. Fill in the blanks: _____ is used to call a constructor in the parent class, while _____ is used to reference a member of the parent class.

- A. `super` and `this()`
- B. `super` and `super()`
- C. `super()` and `this`
- D. `super()` and `super`

23. Given the following method signature, which classes can call it?

```
void run(String government)
```

- A. Classes in other packages

- B. Classes in the same package
- C. Subclasses in a different package
- D. All classes

14. Which statement(s) about the following class would help to properly encapsulate the data in the class?

```
package shield;
public class Protect {
    private String material;
    protected int strength;

    public int getStrength() {
        return strength;
    }
    public void setStrength(int strength) {
        this.strength = strength;
    }
}
```

- I. Change the access modifier of `strength` to `private`.
 - II. Add a getter method for `material`.
 - III. Add a setter method for `material`.
- A. I
 - B. II and III
 - C. I, II, and III
 - D. None, the data in the class is already encapsulated.

15. Which of the following is a valid method name in Java?

- A. `Go_$Outside$2()`
- B. `have-Fun()`
- C. `new()`
- D. `9enjoyTheWeather()`

16. Which of the following lines of code can be inserted in the line below that would allow the class to compile?

```
package farm;
public class Coop {
    public final int static getNumberOfChickens() {
        // INSERT CODE HERE
    }
}
```

- A. `return 3.0;`

B. `return 5L;`

C. `return 10;`

D. None of the above

27. Which of the following is a true statement about passing data to a method?

A. A change made to a primitive value passed to a method is reflected in the calling method.

B. A change made to the data within an object passed to a method is reflected in the calling method.

C. Reassigning an object reference passed to a method is reflected in the calling method.

D. A change made to a `boolean` value passed to a method is reflected in the calling method.

28. What is a possible output of the following application?

```
package wrap;
public class Gift {
    private final Object contents;
    protected Object getContents() {
        return contents;
    }
    protected void setContents(Object contents) {
        this.contents = contents;
    }
    public void showPresent() {
        System.out.print("Your gift: "+contents);
    }
    public static void main(String[] treats) {
        Gift gift = new Gift();
        gift.setContents(gift);
        gift.showPresent();
    }
}
```

A. Your gift: `wrap.Gift@29ca2745`

B. Your gift: Your gift:

C. It does not compile.

D. It compiles but throws an exception at runtime.

29. Which of the following is a valid JavaBean method prefix?

A. `is`

B. `gimme`

C. `request`

D. `put`

30. Given the following two classes, each in a different package, which line inserted below allows the second class to compile?

```
package clothes;
public class Store {
    public static String getClothes() { return "dress"; }
}

package wardrobe;
// INSERT CODE HERE
public class Closet {
    public void borrow() {
        System.out.print("Borrowing clothes: "+getClothes());
    }
}
```

- A. `static import clothes.Store.getClothes;`
- B. `import clothes.Store.*;`
- C. `import static clothes.Store.getClothes;`
- D. `import static clothes.Store;`

31. What access modifier is used to mark class members package-private?

- A. `private`
- B. `default`
- C. `protected`
- D. None of the above

32. How many lines of the following program contain compilation errors?

```
package sky;
public class Stars {
    private int inThe = 4;
    public void Stars() {
        super();
    }
    public Stars(int inThe) {
        this.inThe = this.inThe;
    }
    public static void main(String[] endless) {
        System.out.print(new sky.Stars(2).inThe);
    }
}
```

- A. None
- B. One
- C. Two
- D. Three

3. Which of the following statements is true?

- A. An instance method is allowed to reference a `static` variable.
- B. A `static` method is allowed to reference an instance variable.
- C. A `static` initialization block is allowed to reference an instance variable.
- D. A `final static` variable may be set in a constructor.

4. Given the following method declaration, which line can be inserted to make the code compile?

```
public short calculateDistance(double lat1, double lon1,  
    double lat2, double lon2) {  
    // INSERT CODE HERE  
}
```

- A. `return new Integer(3);`
- B. `return new Byte((byte)6);`
- C. `return 5L;`
- D. `return new Short(4).longValue();`

5. Which of the following statements about overloaded methods are true?

- I. Overloaded methods must have the same name.
- II. Overloaded methods must have the same return type.
- III. Overloaded methods must have a different list of parameters.

- A. I
- B. I and II
- C. I and III
- D. I, II, and III

6. How many lines of code would need to be removed for the following class to compile?

```
package work;  
public class Week {  
    private static final String monday;  
    String tuesday;  
    final static wednesday = 3;  
    final protected int thursday = 4;  
}
```

- A. One
- B. Two
- C. Three
- D. The code will not compile regardless of the number of lines removed.

37. What is the output of the following application?

```
package pet;
public class Puppy {
    public static int wag = 5;    // q1
    public void Puppy(int wag) { // q2
        this.wag = wag;
    }
    public static void main(String[] tail) {
        System.out.print(new Puppy(2).wag); // q3
    }
}
```

- A. 2
- B. It does not compile because of line q1.
- C. It does not compile because of line q2.
- D. It does not compile because of line q3.

38. Fill in the blanks: The _____access modifier allows access to everything the _____access modifier does and more.

- A. public, private
- B. private, package-private
- C. package-private, protected
- D. private, public

39. What is the output of the following application?

```
package ship;
public class Phone {
    private int size;
    public Phone(int size) {this.size=size;}

    public static void sendHome(Phone p, int newSize) {
        p = new Phone(newSize);
        p.size = 4;
    }
    public static final void main(String... params) {
        final Phone phone = new Phone(3);
        sendHome(phone, 7);
        System.out.print(phone.size);
    }
}
```

- A. 3
- B. 4
- C. 7
- D. The code does not compile.

10. Given the following class, which line of code when inserted below would prevent the class from compiling?

```
public class Drink {  
    public static void water() {}  
    public void get() {  
        // INSERT CODE HERE  
    }  
}
```

- A. `water();`
- B. `this.Drink.water();`
- C. `this.water();`
- D. `Drink.water();`

11. Given the following method declaration signature, which of the following is a valid call of this method?

```
public void call(int count, String me, String... data)
```

- A. `call(9, "me", 10, "Al")`
- B. `call(5)`
- C. `call(2, "home", "sweet")`
- D. `call("answering", "service")`

12. Which statement about a `static` variable is true?

- A. The value of a `static` variable must be set when the variable is declared or in a `static` initialization block.
- B. It is not possible to read `static final` variables outside the class in which they are defined.
- C. It is not possible to reference `static` methods using `static` imports.
- D. A `static` variable is always available in all instances of the class.

13. Which of the following is not a true statement?

- A. The first line of every constructor is a call to the parent constructor via the `super()` command.
- B. A class does not have to have a constructor explicitly defined.
- C. A constructor may pass arguments to the parent constructor.
- D. A `final` instance variable whose value is not set when they are declared or in an initialization block should be set by the constructor.

14. How many `final` modifiers would need to be removed for this application to compile?

```
package park;
public class Tree {
    public final static long numberOfTrees;
    public final double height;
    static {}
    { final int initHeight = 2;
      height = initHeight;
    }
    static {
        numberOfTrees = 100;
        height = 4;
    }
}
```

- A. None
- B. One
- C. Two
- D. The code will not compile regardless of the number of `final` modifiers removed.

15. What is the output of the following application?

```
package jungle;
public class RainForest extends Forest {
    public RainForest(long treeCount) {
        this.treeCount = treeCount+1;
    }
    public static void main(String[] birds) {
        System.out.print(new RainForest(5).treeCount);
    }
}
class Forest {
    public long treeCount;
    public Forest(long treeCount) {
        this.treeCount = treeCount+2;
    }
}
```

- A. 5
- B. 6
- C. 8
- D. The code does not compile.

16. What is the output of the following application?

```
public class ChooseWisely {
    public ChooseWisely() { super(); }
    public int choose(int choice) { return 5; }
    public int choose(short choice) { return 2; }
    public int choose(long choice) { return 11; }
    public static void main(String[] path) {
        System.out.print(new ChooseWisely().choose((byte)2+1));
    }
}
```

}

- A. 5
- B. 2
- C. 11
- D. The code does not compile.

17. What is the output of the following application?

```
package sports;
public class Football {
    public static Long getScore(Long timeRemaining) {
        return 2*timeRemaining; // m1
    }
    public static void main(String[] refs) {
        final int startTime = 4;
        System.out.print(getScore(startTime)); // m2
    }
}
```

- A. 8
- B. The code does not compile because of line `m1`.
- C. The code does not compile because of line `m2`.
- D. The code compiles but throws an exception at runtime.

18. Which of the following is a valid method name in Java?

- A. `$sprint()`
- B. `\jog13()`
- C. `walk#()`
- D. `%run()`

19. Assume there is a class `Bouncer` with a protected variable. Methods in which class can access this variable?

- A. Only subclasses of `Bouncer`
- B. Any subclass of `Bouncer` or any class in the same package as `Bouncer`
- C. Only classes in the same package as `Bouncer`
- D. Any superclass of `Bouncer`

20. Given the following two classes, each in a different package, which line inserted below allows the second class to compile?

```
package commerce;
public class Bank {
    public void withdrawal(int amountInCents) {}
    public void deposit(int amountInCents) {}
}
```



```
}

package employee;
// INSERT CODE HERE
public class Teller {
    public void processAccount(int depositSlip, int withdrawalSlip) {
        withdrawal(withdrawalSlip);
        deposit(depositSlip);
    }
}
```

- A. `import static commerce.Bank.*;`
- B. `static import commerce.Bank.*;`
- C. `import static commerce.Bank;`
- D. None of the above