

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_ Section: \_\_\_\_\_

**Multiple Choice** Select the letter in front of the most correct answer.

1. True/False: Testing and debugging are not the same activity.
  - a. True
  - b. False
2. True/False: After an array is created, its length can be increased but not decreased.
  - a. True
  - b. False
3. True/False: The `protected` modifier is used to indicate that a method cannot be overridden.
  - a. True
  - b. False
4. True/False: A `static` variable is unique in that the value does not change.
  - a. True
  - b. False
5. True/False: A `static` method in class can never reference an instance variable of the class.
  - a. True
  - b. False
6. True/False: Having multiple methods in a class with the same name but difference signatures is called method decompositions.
  - a. True
  - b. False
7. Suppose a method in class C1 creates an instance of class C2. A general dependency between class C1 and class C2 is which of the following relationships?
  - a. C1 is-a C2
  - b. C2 is-a C1
  - c. C1 uses C2
  - d. C1 has-a C2
  - e. C2 has-a C1
8. Suppose class C2 extends class C1. An inheritance dependency is which of the following relationships?
  - a. C1 is-a C2
  - b. C2 is-a C1
  - c. C1 uses C2
  - d. C1 has-a C2
  - e. C2 has-a C1

9. For class C1 and class C2, suppose class C1 has an instance variable of type C2. An aggregation dependency between class C1 and class C2 is which of the following relationships?
- C1 is-a C2
  - C2 is-a C1
  - C1 uses C2
  - C1 has-a C2
  - C2 has-a C1
10. True/False: The parameter of the `main` method in Java typically contains the compiler instructions for the program and/or the number of times to run the program.
- True
  - False
11. True/False: A `static` variable can be referenced by all methods in the class.
- True
  - False
12. In Java, interfaces may **not** contain \_\_\_\_\_. Check all that apply.
- abstract methods
  - constants
  - public instance variables
  - private instance variables
  - private methods
13. After the line of code below is executed what will be the value of `names[7]`?
- ```
String[] names = new String[10];
```
- 0
  - " "
  - true
  - 7
  - null
14. True/False: In Java, abstract methods always end with `{ }`.
- True
  - False
15. Which interface in the Java API should be used to define how objects can be compared for their natural ordering?
- `Equality`
  - `Compare`
  - `Logical`
  - `Iterator`
  - `Comparable`

16. Suppose `myArray` is declared in the `main` method and then passed into method `myMethod` as shown below. After `myMethod` completes and returns to `main`, what would be the result of printing each element in the array separated by a space?

```
public static void main(String[] args) {  
    int[] myArray = new int[5];  
    myMethod(myArray);  
    for (int i : myArray) {  
        System.out.print(i + " ");  
    }  
}  
  
public static void myMethod(int[] integerArray) {  
    integerArray[3] += 1;  
}
```

- a. 0 0 0 0 0
- b. 1 0 0 0 0
- c. 0 1 0 0 0
- d. 0 0 1 0 0
- e. 0 0 0 1 0

17. What is printed after executing the following loop? Hint: Be aware of any method calls on `null` objects.

```
public static void forEachPrint()  
{  
    String[] stringArray = new String[5];  
    stringArray[1] = "    COMP1210    ";  
  
    for (String element : stringArray)  
    {  
        System.out.print(element.trim() + " ");  
    }  
}
```

- a. COMP1210
- b. COMP1210
- c. COMP1210 null null null null
- d. COMP1210 and then a `NullPointerException` occurs
- e. `NullPointerException` occurs

Use the code below to answer questions 18 - 21. Answer pass, fail, or neither for each JUnit test. Assume all necessary imports.

```
import org.junit.Assert;
import org.junit.Test;

public class PracticeExamJUnitTest {

    @Test public void firstTest() {
        String s = "hello";
        String s2 = "Hello";
        Assert.assertTrue("Strings did not match. ", s.equals(s2));
    }

    @Test public void secondTest() {
        double closeToZero = 0.00001;
        double zero = 0;
        Assert.assertEquals("Second test failed. ", zero, closeToZero, .0001);
    }

    @Test public void thirdTest() {
        int[] listOfInts = {1, 2, 3, 4, 5};
        int[] listOfOtherInts = {1, 2, 3};

        boolean isPassing = listOfInts[4] % 4 == 0;
        Assert.assertTrue("There was a problem in third test. ", isPassing);
    }

    @Test public void fourthTest() {
        int[] listOfInts = {1, 2, 3, 4, 5};
        Assert.assertTrue("Something went wrong. ", listOfInts[3] / 4 == 1);
    }
}
```

18. What is the result of `firstTest`?

- a. pass      b. fail

19. What is the result of `secondTest`?

- a. pass      b. fail

20. What is the result of `thirdTest`?

- a. pass      b. fail

21. What is the result of `fourthTest`?

- a. pass      b. fail

22. For the code below, you desire to print the last parameter of the variable length parameter. Fill in the blank below to accomplish that.

```
public static void printTheLastParameter(int ... parameterList) {  
    System.out.println(__21__);  
}
```

- a. parameterList
  - b. parameterList[end]
  - c. parameterList[length]
  - d. parameterList[parameterList.length - 1]
  - e. parameterList.get(last)
23. True/False: An abstract method in a super class can never be overridden in any immediate subclass.
- a. True
  - b. False
24. True/False: An overridden method has the same body but different signature.
- a. True
  - b. False
25. In Java, a parent class can have a maximum of \_\_\_\_\_ child classes?
- a. 0
  - b. 1
  - c. 2
  - d. 3
  - e. None of the above.
26. True/False: The `protected` access modifier can be applied to the fields of a class to allow subclasses and classes in the same package direct access to the fields.
- a. True
  - b. False
27. Which of the following are inherited by a subclass? (circle all that apply)
- a. public methods
  - b. public variables
  - c. protected variables
  - d. protected methods
  - e. constructors
28. What is the natural order of the array below?
- ```
String[] pets = {"dog", "cat", "bird", "hamster"};
```
- a. "cat", "dog", "bird", "hamster"
  - b. "hamster", "dog", "cat", "bird"
  - c. "dog", "cat", "bird", "hamster"
  - d. "bird", "cat", "dog", "hamster"
  - e. "bird", "dog", "cat", "hamster"

29. True/False: If you wanted to sort items in an order other than their natural ordering, the `Comparator` interface in the Java API should be implemented.
- a. True
  - b. False
30. Suppose `s1` and `s2` are objects of the `String` class, which implements the `Comparable` interface. If the values of `s1` and `s2` are "sun" and "son" respectively, what is the expected return value when `s1.compareTo(s2)` is called? [also: "sun".compareTo("son") ]
- a. false
  - b. true
  - c. An int value greater than zero
  - d. An int value less than zero
  - e. An int value equal to zero
31. True/False: Suppose parent class `P` has a child class `C` (i.e., `C` extends `P`), and we have the following assignment of a child `C` object to a reference of the parent type `P`:
- ```
P p = new C();
```
- Then any method defined in the parent class `P` can be called on `p` without casting.
- c. True
  - d. False
32. True/False: A reference variable of type `C` can refer to an object of class `C` or to an object of any subclass of `C`, as well as any object the parent of `C`.
- a. True
  - b. False
33. True/False: If a checked exception is not caught or listed in the `throws` clause and you attempt to compile and/or execute the program, a run-time error occurs?
- a. True
  - b. False
34. True/False: The unchecked exceptions in Java are objects of type `IOException` or any of its descendants.
- a. True
  - b. False
35. True/False: An input/output (I/O) stream is a sequence of bytes that flow from a source to a destination.
- a. True
  - b. False
36. Which of the following streams is typically associated with a program printing to the screen using the `println` method?
- a. `System.err`
  - b. `System.in`
  - c. `System.out`
  - d. b & c above
  - e. All of the above (a, b, & c)

37. True/False: An Exception is an object that describes an unusual or erroneous situation.
- True
  - False
38. True/False: If an expression that includes integer division by zero (e.g., `10 / 0`) is evaluated, an exception is thrown (i.e., run-time error occurs).
- True
  - False
39. True/False: With respect to inheritance, a subclass inherits instance variables and instance methods defined in its parent but not those defined in the ancestors of the parent.
- True
  - False
40. True/False: In object-oriented programming, a `class` can be considered as an encapsulation of first-generation and second-generation languages.
- True
  - False
41. True/False: When a method is declared as `private`, it can be accessed within the class, but it cannot be accessed from outside the class.
- True
  - False
42. True/False: A `public static` method can be referenced from another class by using the class name and the dot notation.
- True
  - False
43. The signature of a method is determined by \_\_\_\_\_.
- name
  - number of parameters
  - type of parameters
  - order of parameters
  - All of the above
44. Which one of the following is a correct declaration and instantiation of an array?
- `int[] scores;`
  - `int[] scores = new int[1.5];`
  - `int[] scores = {"low", "high"};`
  - `int[] scores = new int[15];`
  - All of the above
45. True/False: When the constructor of a subclass is called, the parameterless constructor in the super class is called only when the instance is created by a constructor with parameters.
- True
  - False

46. True/False: When a method creates a `Scanner` object to read from a file (i.e., a `Scanner` object created with a `File` object as the parameter), the potential exception (e.g., `FileNotFoundException` or `IOException`) must be handled with `try-catch` blocks; there is no other alternative.
- a. True
  - b. false
47. True/False: When a method uses a `PrintWriter` object to write to a file, simply invoking the `println` method on the `PrintWriter` object will ensure that the data is written to the file.
- a. True
  - b. false
48. True/False: When an exception occurs the call stack trace that shows the methods that were invoked along the path to the where the exception occurred.
- a. True
  - b. false
49. True/False: When a method is called, if an exception occurs and it is not caught and handled in the method, then the exception is printed immediately from the calling method rather being propagated to the calling method.
- a. True
  - b. false
50. True/False: When a `try` block is executed (and `System.exit` is not called), the associated `finally` block (if it has one) will execute only if the `try` block does not throw an exception.
- a. True
  - b. false