**44-542 Object Oriented Programming Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Exam 02 (100 points) Part 1 KEY** *please print*

**Multiple choice (50 points – 2 points each).**  Write the letter corresponding to the BEST correct answer.

***Select only ONE answer for each question. If you select more than one answer, the entire question will be counted as wrong.***

1. In a UML diagram, which visibility specifier is used to represent public access?
   1. +
   2. -
   3. #
   4. %
2. The collection of values of the instance variables of an object is called its \_\_\_\_\_.
   1. behavior
   2. condition
   3. inheritance
   4. state
3. Which of the following is true of protected instance variables?
   1. they can be accessed by all subclasses
   2. they cannot be accessed by other classes, except for subclasses
   3. both a) and b)
   4. none of the above
4. Which of the following is true of an abstract method?
   1. it is declared with the keyword abstract
   2. it has no method body
   3. it must be overridden by all subclasses, except for subclasses also declared as abstract
   4. all of the above
   5. a) and b) only
5. Which of the following is true of an abstract class?
   1. an abstract class cannot be instantiated
   2. an abstract class cannot have subclasses
   3. an abstract class must have at least one abstract method
   4. all of the above
   5. a) and c) only
6. If a class has no toString method, Java searches the class hierarchy until it finds a class with toString implemented and then invokes that method. This is an example of \_\_\_\_\_.
   1. polymorphic substitution
   2. late-binding polymorphism
   3. inheritance
7. Classes that have all methods fully implemented and are not declared as abstract are sometimes referred to as \_\_\_\_\_ classes.
   1. compact
   2. concrete
   3. implemented
   4. well-defined
8. Which of the following is true for interfaces?
   1. all methods are abstract
   2. all methods are public
   3. no constants are allowed
   4. all of the above
   5. a) and b) only
9. Assume we have a class Employee and a second class HourlyEmployee that extends Employee. Both classes have a toString method. Now suppose we write the following code:

Employee emp = new HourlyEmployee(…);

System.out.println(emp.toString());

The reference variable emp is of type Employee, but at runtime, the runtime system will use the toString method of the HourlyEmployee class. This is an example of \_\_\_\_\_.

* 1. polymorphic substitution
  2. late-binding polymorphism
  3. inheritance

1. Classes \_\_\_\_\_ classes; classes \_\_\_\_\_ interfaces; interfaces \_\_\_\_\_ interfaces.
   1. extend, implement, implement
   2. extend, extend, extend
   3. extend, implement, extend
   4. implement, extend, extend
2. Multiple inheritance is forbidden in Java.
   1. true
   2. false
3. A reference variable’s type may be that of an interface.
   1. true
   2. false
4. All subclasses of the Exception class are checked exceptions.
   1. true
   2. false
5. Which of the following is true of try-catch blocks?
   1. a try block can be followed by multiple catch blocks
   2. each catch clause must catch a different type of exception
   3. if a try is followed by multiple catch blocks, at most one catch block will be executed
   4. all of the above
6. The superclass inherits all attributes and methods of the subclass.
   1. true
   2. false
7. For sorting in Java, use the sort method from the \_\_\_\_\_ class.
   1. ArrayList
   2. Collection
   3. Collections
   4. Utility
8. In order for a class to extend another class, it must pass the “has-a” test.
   1. true
   2. false
9. The natural order for objects in a class is defined by the \_\_\_\_\_ method of the \_\_\_\_\_ interface.
   1. compare, Comparator
   2. compareTo, Comparator
   3. compare, Comparable
   4. compareTo, Comparable
10. Every Java class automatically extends the Object class.
    1. true
    2. false
11. In the Object class, for non-null reference values x and y, x.equals(y) is true if and only if x == y is true.
    1. true
    2. false
12. Part of the process of extending a class by creating a subclass may be to
    1. add new instance variables to the superclass
    2. add new methods to the subclass
    3. both a) and b)
    4. none of the above
13. Java requires that the natural ordering for a class be consistent with equals.
    1. true
    2. false
14. Suppose we have a class Employee, and a second class HourlyEmployee that extends the Employee class. The following statement is valid

Employee emp = new HourlyEmployee(…);

This is an example of \_\_\_\_\_.

* 1. polymorphic substitution
  2. late-binding polymorphism
  3. inheritance

1. Subclasses inherit the behavior of the superclass. The only way to modify the behavior of a subclass is to define a new method.
   1. true
   2. false
2. An object’s type can be that of an interface.
   1. true
   2. false