Test 1

1. In Java, if you do not specify a visibility level for a class member, the visibility level will be ___________________________________
    a. Protected
    b. Public
    c. Package
    d. Private
2. Which of the following can be the declared type in the Java programming language (as allowed by the compiler, not following any best practices we discussed).
    a. Interface
    b. Abstract class
    c. Class
    d. Extended interface
    e. Extended Non-Abstract Class
3. In Java, a main function must…
    a. Be a member of a class
    b. Have one argument, an array of strings
    c. Be static
    d. Return an int
4. Static methods can access
    a. Public static data
    b. Public final data
    c. Private final data
    d. Private data
    e. Public data
    f. Private static data
5. Which of the following can be in an interface file
    a. Any type of private method
    b. Constructors
    c. Public default methods
    d. Any type of public method

e. Any type of public variables

f. Private data variables

g. Public static final data variables

h. Public abstract methods

6. What should be included as part of a user story

a. Any relevant non-functional requirements

b. A description of the user interface

c. The step-by-step process for completing the action

d. The role of the user

e. The action the user will take in the system

f. The benefit to the user

7. A(n) ______________________________ can *implement* a(n)
__________________________________ in Java. (order matters)

a. Interface, Abstract class

b. Abstract class, class

c. Class, class

d. Class, Interface

e. Interface, class

f. Abstract class, interface

g. Interface, interface

h. Class, abstract class

8. Which of the following can be in an Abstract Class (syntactically allowed by Java)?

a. Public abstract methods

b. Public methods with a body

c. Private data variables

d. Any type of private methods

9. At which times is it safe to assume that the invariant of a class is true?

a. When the object has been declared, but not initialized

b. During the body of a public method

c. Before the constructor is called

d. Before the execution of a private method

e. After a public method has finished

f. At the beginning of a public method

g. After the execution of a private method

h. After the constructor for the object has completed

10. Which of the following are helpful methods provided by the Object class

a. Equals

b. toUpper

c. Validate

d. Sort

e. toString

11. When the *final* keyword is used on a reference variable (of type *Foo*), which of the following are true about that reference variable. The class *Foo* that is being referenced does not contain any *final* data types.

a. The value of the referenced object can change

b. The reference (memory location) cannot change

c. The reference (memory location) can change

d. The value of the referenced object cannot change

12. A(n) ________________________________ can *extend* a(n) _____________________________ in Java (order matters)

a. Class, abstract class

b. Interface, class

c. Class, interface

d. Class, class

e. Interface, abstract class

f. Interface, interface

g. Abstract class, Interface

13. Static data members belong to the ________________________________

a. Instance

b. Public methods

c. Class

d. Private methods

e. Object

14. Who is responsible for making sure that the postcondition of a method is met?

    a. Both the client and the implementer are responsible

    b. Neither the client nor the implementer is responsible

    c. The implementer of the method

    d. The client that calls the method

15. For any of the following questions on abstraction, use this information. Suppose that a *Stack* is abstractly a string of entries. Suppose also that *push(x)* has the postcondition: *self = [x added to the front of #self]* and that *pop( )* has the postcondition: *self = [pop() return removed from the front of #self]*. If a stack *s* starts with the abstract value <15, 10, 5>, what would be its value after the sequence of statements: s.pop(); s.push(8);

    a. <8, 15, 10>

    b. <10, 5, 8>

    c. <15, 10, 8>

    d. <15, 10, 5>

    e. <8, 10, 5>

16. For any of the following questions on abstraction, use this information. Suppose that a *Stack* is abstractly a string of entries. Suppose also that *push(x)* has the postcondition: *self = [x added to the front of #self]* and that *pop( )* has the postcondition: *self = [pop() return removed from the front of #self]*. Which of the following alternative postconditions of *push(x)* are incorrect?

    a. #self = [x added to the front of self]

    b. length of self = length of #self

    c. self = #self

17. ________________________________ occurs when we have two or more pointers to the same memory location. This can cause errors in our program if we are not aware or do not mean for this to happen

    a. aliasing

18. When Java is determining which version of an overridden method to run, it will use the method in the ______________________________type of the receiver.

    a. dynamic

19. Every class in Java extends the ________________________________ class, which provides some basic methods that we will want to override such as *toString()* and *equals()*.

    a. Object

20. The principle of _________________________________ is about keeping inessential information hidden.

    a. Information Hiding

21. When the Java compiler is determining whether an object in the code has a method available to be called by the client code, it will check the ____________________________________ type of the object to see if the method exists.

    a. Declared

22. Java provides a structure called a __________________________________ which is a grouping of (hopefully) related classes.

    a. package

23. The _______________________________________ is the contract that specifies what must be true after a method has finished.

    a. Postcondition

24. ________________________________ are used to tie our private data variables in the implementation to the abstract concepts that appear in our interface specification.

    a. correspondences

25. Pick all true statements.

    a. Class invariants are useful to place restrictions on individual private fields of a class.

    b. A well-designed class will have no class invariants.

    c. Class invariants are useful to place restrictions on the relationships between private fields of a class.

26. What is the intent of Design-By-Contract? How does it help large development teams work together on and communicate about a large software development project?

    a. Design by contract is the idea of developing and using contracts as the intermediary between developers and users of software modules. Once contracts are in place, module developers and module users can write their code independently in large software development projects.