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Score: 0 / 25 (0%)

AP Chapter 5 Test

MULTIPLE CHOICE

✗ ___ 1. Static methods cannot

a. reference instance data
b. reference non-static instance data
c. reference other objects
d. invoke other static me
e. invoke non-static me

Answer: B
A static method is a method that is part of the class itself, not an instantiated object, and therefore the static method is shared among all instantiated objects of the class. Since the static method is shared, it cannot access non-static instance data because all non-static instance data are specific to instantiated objects. A static method can access static instance data because, like the method, the instance data is shared among all objects of the class. A static method can also access parameters passed to it

Points: 0 / 1

✗ ___ 2.

```
public class StaticExample
{
        private static int x;

        public StaticExample (int y)
        {
                x = y;
        }

        public int incr( )
        {
                x++;
                return x;
        }
}
```

What is the value of z after the third statement executes below?
StaticExample a = new StaticExample(5);
StaticExample b = new StaticExample(12);
int z = a.incr( );

a. 5
b. 6
c. 12
d. 13
e. none, the code is syntactically invalid because a and b are attempting to share an instance data

Answer: D
Since instance data x is shared between a and b, it is first initialized to 5, it is then changed to 12 when b is instantiated, and then it is incremented to 13 when a.incr( ) is performed. So, incr returns the value 13

Points: 0 / 1

✗ ___ 3. An object that refers to part of itself within its own methods can use which of the following reserved words to denote this relationship?

a. inner
b. i
c. private
d. this
e. static

Answer: D
The reserved word *this* is used so that an object can refer to itself. For instance, if an object has an instance data x, then this.x refers to the object's value x. While *this* is not necessary, it can be useful if a local variable or parameter is named the same as an instance data. The reserved word this is also used to refer to the class as a whole, for instance, if the class is going to implement an interface class rather than import an

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✗___ 4. In order to implement Comparable in a class, what method(s) must be defined in that class?

a. equals
b. compares
c. both lessThan and greatThan
d. compareTo
e. both compares and equalThan

Answer: D
The Comparable class requires the definition of a compareTo method that will compare two objects and determine if one is equal to the other, or if one is less than or greater than the other and respond with a negative int, 0 or a positive int. Since compareTo responds with 0 if the two objects are equal, there is no need to also define an equals method.

Points: 0 / 1

✗___ 5. If s is a String, and s = "no"; is performed, then s

a. stores the String "no"
b. references the memory location where "no" is stored
c. stores the characters 'n', 'o'
d. stores an int value that represents the two characters
e. stores the character 'n' and a reference to the memory location where the next character, 'o' is stored

Answer: B
Strings are objects and all objects in Java are referenced by the variable declared to be an object. That is, the variable represents the memory location where the object is stored. So, s does not directly store "no" or 'n', 'o', but instead stores a memory location where "no" is stored

Points: 0 / 1

✗___ 6. A Java program can handle an exception in several different ways. Which of the following is not a way that a Java program could handle an exception?

a. ignore the exception
b. handle the exception where it arose using try and catch statements
c. propagate the exception to another method where it can be handled
d. throw the exception to a pre-defined Exception class to be handled
e. all of the above are ways that a Java program could handle an exception

Answer: D
A thrown exception is either caught by the current code if the code is contained inside a try statement and the appropriate catch statement is implemented, or else it is propagated to the method that invoked the method that caused the exception and caught there in an appropriate catch statement, or else it continues to be propagated through the methods in the opposite order that those methods were invoked. This process stops however once the main method is reached. If not caught there, the exception causes termination of the program (this would be answer a, the exception was ignored). However, an exception is not thrown to an Exception class

Points: 0 / 1

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✗___ 7. In order to have some code throw an exception, you would use which of the following reserved words?

a. throw
b. throws
c. try
d. Throwable
e. goto

Answer: A
The reserved word throw is used to throw an exception when the exception is detected, as in: if (score < 0) throw new IllegalTestScoreException("Input score " + score + " is negative")

Points: 0 / 1

✗___ 8. For question 9, consider a class that stores 2 int values. These values can be assigned int values with the messages set1(x) and set2(x) where x is an int, and these values can be accessed through get1( ) and get2( ). Assume that y and z are two objects of this class. The following instructions are executed.

```
y.set1(5);
y.set2(6);
z.set1(3);
z.set2(y.get1( ));
y = z;
```

The statement z.get2( ); will

a. return 5
b. return 6
c. return 3
d. return 0
e. cause a run-time error

Answer: A
The statement y.get1( ) returns the value 5, and therefore the statement z.set2(y.get1( )) sets the second value of z to be 5, so that z.get2( ) returns 5

Points: 0 / 1

✗___ 9. For question 0, assume x and y are String variables with x = "Hello" and y = null

The result of (x = = y) is

a. true
b. false
c. a syntax error
d. a run-time error
e. x being set to the value null

Answer: B
x is a String instantiated to the value "Hello" and y is a String that has not yet been instantiated, so they are not the same String. (x = = y) is a condition, testing to see if x and y are the same String (that is, x and y reference the same item in memory), which they don't, so the result is false.

Points: 0 / 1

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ⓧ___ 10. For question 10 assume x and y are String variables with x = "Hello" and y = null

The result of x.length( ) + y.length( ) is

a. 0
b. 5
c. 6
d. 10
e. a thrown exception

Answer: E
The statement y.length( ) results in a thrown NullPointException because it is not possible to pass a message to an object that is not currently instantiated (equal to null)

Points: 0 / 1

TRUE/FALSE

ⓧ___ 11. Several variables can reference the same object.

Answer: T
When variables reference the same object, they are known as aliases. As an example, consider the following code. In it, x, y and z all reference the same String (they do not just equal the same value, they are all the same String) and so they are all aliases of each other.

```
String x = "hi";
String y = x;
String z = y;
```

Points: 0 / 1

ⓧ___ 12. The = = operator performs differently depending on whether the variables being compared are primitives types or objects.

Answer: T
If two objects are being compared using = =, then the comparison returns true if the two objects are aliases (the same object). But if two primitive data types are being compared, then the comparison returns true if the two variables store the same value

Points: 0 / 1

ⓧ___ 13. If first and last are both String variables, then first.equals(last); does the same thing as (first = = last).

Answer: F
The statement first.equals(last); compares the two Strings referenced by first and last to see if the Strings store the same character, while (first = = last) determines if first and last reference the same String, that is, are aliases.

Points: 0 / 1

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ⓧ___ 14. If String x = null; then x.length( ); returns the int 0

Answer: F
Since x is null, the instruction x.length( ); tries to pass the length( ) message to no object. This cannot occur and so a NullPointerException is thrown

Points: 0 / 1

ⓧ___ 15. Assume that the class Bird has a static method fly( ). If b is a Bird, then to invoke fly, you could do Bird.fly( );

Answer: T
. Explanation: Static methods are invoked through the class and not an object of the class. This is because the static method is shared among all instances. So, Bird.fly( ); will invoke fly. It should be noted that fly can also be invoked through b, so b.fly( ); will also work.

Points: 0 / 1

ⓧ___ 16. If an exception is thrown and is not caught anywhere in the program, then the program terminates

Answer: T
Exceptions are events of interest or are run-time situations that cannot be handled normally without an exception handler. An exception is caught by an associated exception handler. If the exception is thrown but not handled, then the program must terminate

Points: 0 / 1

ⓧ___ 17. Any class can implement an interface, but no classes can implement more than a single interface.

Answer: F
Classes can implement any number of interfaces, 0, 1, or more

Points: 0 / 1

ⓧ___ 18. An object uses the "this" reserved word to refer to itself.

Answer: T
The "this" reserved word refers to the currently executing object

Points: 0 / 1

ⓧ___ 19. Assuming name is a String variable, the test if (name != null && name.length() < 10) will cause a NullPointerException if name is null.

Answer: F
If name is null, the && will short-circuit and name.length() will not be evaluated.

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✗ ___ 20. All objects implement Comparable.

Answer: F
Comparable is an interface, and the class must define the compareTo method and explicitly state that it implements Comparable to be considered an implementation of Comparable. Most classes do not implement Comparable
Points: 0 / 1

✗ ___ 21. Any variable can take on the value null to indicate that it has no value.

Answer: F
: Only variable that are object references can be null, which indicate that they do not refer to any object. Variables of primitive types such as int and double cannot be assigned null
Points: 0 / 1

✗ ___ 22. When an int is passed as a parameter, the formal and actual parameters become alises of each other.

Answer: F
That only happens with objects. When an int is passed, the value of the actual parameter is copied into the formal parameter, and any changes made to the formal parameter do not affect the actual parameter
Points: 0 / 1

✗ ___ 23. A class that implements an interface must implement every method in the interface.

Answer: T
If not, a syntax error will occur.
Points: 0 / 1

✗ ___ 24. Variables should never be static.

Answer: F
Constants (final variables) are good candidates for static variables. Since their value cannot change, there is no need to have a separate copy for each object
Points: 0 / 1

✗ ___ 25. The statements String a = “hi”; String b = a + “”; cause a and b to be alises of each other.

Answer: F
The string concatenation operator (+) creates a new String and assigns it to b, so a and b are not aliases, they simply contain the same characters. (a + “” is adding the empty string to a, so b gets assigned “hi”.)