AP Computer Science
Chapter 7 Test Review

1. Multiple-Choice Questions

1) During program development, software requirements specify
A) how the program will accomplish the task
B) what the task is that the program must perform
C) how to divide the task into subtasks
D) how to test the program when it is done
E) all of the above

Answer: B

2) Once we have implemented the solution, we are not done with the problem because
A) the solution may not be the best (most efficient)
B) the solution may have errors and need testing and fixing before we are done
C) the solution may, at a later date, need revising to handle new specifications
D) the solution may, at a later date, need revising because of new programming language features
E) all of the above

Answer: E

3) Of the various phases in software development, which of the following is usually the lengthiest?
A) specification
B) design
C) implementation
D) testing
E) maintenance

Answer: E

4) A bad programming habit is to build an initial program and then spend a great deal of time modifying the code until it is acceptable. This is known as
A) the prototyping approach
B) the waterfall model
C) iterative development
D) the recursive approach
E) the build-and-fix approach

Answer: E

5) The activities of the development cycle are generally thought to
A) be strictly linear
B) be rigidly ordered
C) overlap
D) have optional steps
E) both A and B are true

Answer: C

6) The idea of having programmers and developers meet in order to critique a software design or implementation is known as
A) an interview
B) a walkthrough
C) prototyping
D) aggregation
E) evolutionary development

Answer: B

7) It is easier to correct errors found in a program if
A) they are identified early in the development cycle
B) they are identified during testing
C) they are identified during program use
D) they are identified during maintenance
E) all of the above are equally true, errors are easily corrected in any of these stages

Answer: A

8) In general, spending more time in development to ensure better software will
A) shorten testing time
B) slightly reduce maintenance efforts
C) slightly increase maintenance efforts
D) greatly reduce maintenance efforts
E) not alter the time it takes for any other stage whatsoever

Answer: D

9) In order to create a constant, you would use which of the following Java reserved words?
A) `private`
B) `static`
C) `int`
D) `final`
E) class

Answer: D

10) Which of the following methods is a static method? The class in which the method is defined is given in parentheses following the method name.
A) `equals` (`String`)
B) `toUpperCase` (`String`)
C) `sqrt` (`Math`)
D) `format` (`DecimalFormat`)
E) `paint` (`Applet`)

Answer: C

11) Static methods cannot
A) reference instance data
B) reference non-static instance data
C) reference other objects
D) invoke other static methods
E) invoke non-static methods

Answer: B

12) 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

13) An example of an aggregation relationship is
A) parent and child
B) animal and dog
C) teacher and computer
D) phone and fax machine
E) all of the above

Answer: C

14) Java does not support multiple inheritance, but some of the abilities of multiple inheritance are available by
A) importing classes
B) implementing interfaces
C) overriding parent class methods
D) creating aliases
E) using public rather than protected or private modifiers

Answer: B

15) Abstract methods are used when defining
A) interface classes
B) derived classes
C) classes that have no constructor
D) arrays
E) classes that have no methods

Answer: A

16) Which of the following interfaces would be used to implement a class that represents a group (or collection) of objects?
A) `Iterator`
B) `Speaker`
C) `Comparable`
D) `MouseListener`
E) `KeyListener`

Answer: A

17) 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 `greaterThan`
D) `compareTo`
E) both `compares` and `equals`

Answer: D

18) It is important to dissect a problem into manageable pieces before trying to solve the problem because
A) most problems are too complex to be solved as a single, large activity
B) most problems are solved by multiple people and it is easy to assign each piece to a separate person
C) it is easier to integrate small pieces of a program into one program than it is to integrate one big chunk of code into one program
D) our first solution may not solve the problem correctly
E) all of the above

Answer: A

19) Having multiple class methods of the same name where each method has a different number of or type of parameters is known as
A) encapsulation
B) information hiding
C) tokenizing
D) importing
E) method overloading

Answer: E

20) The goal of testing is to
A) ensure that the software has no errors
B) find syntax errors
C) find logical and run-time errors
D) evaluate how well the software meets the original requirements
E) give out-of-work programmers something to do

Answer: C

21) In which phase of program development would you expect the programmer(s) to determine the classes and objects needed?
A) software requirements
B) software design
C) software implementation
D) software testing
E) could occur in any of the above

Answer: B

22) If a programmer follows the four phases of program development as intended, which of the four phases should require the least amount of creativity?
A) software requirements
B) software design
C) software implementation
D) software testing
E) none of the above, all four levels would require equal creativity

Answer: C

2. True/False Questions (Mark "A" for True and "B" for False)

23) The most important decisions regarding the development of a system are made during the implementation phase while code is actively being written.

Answer: FALSE

24) Unlike the String class where you must pass a message to an object (instance) of the class, as in `x.length( )`, in order to use the Math class, you pass messages directly to the class name, as in `Math.abs( )` or `Math.sqrt( )`.

Answer: TRUE

25) 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: TRUE

26) Interface classes cannot be extended but classes that implement interfaces can be extended.

Answer: FALSE

27) If classes `C1` and `C2` both implement an interface `Cint`, which has a method `whichIsIt`, and if `C1 c = new C1( );` is performed at one point of the program, then a later instruction `c.whichIsIt( );` will invoke the `whichIsIt` method defined in `C1`.

Answer: TRUE

28) Any class can implement an interface, but no classes can implement more than a single interface.

Answer: FALSE

29) All objects implement Comparable.

Answer: FALSE

3. Free-Form/Short Answer Questions

30) Provide a reason why an instance data would be declared static.

Answer: If an instance data is to be shared among all objects of the class, the instance data would be static. As an example, an instance data that counts the number of times something has happened across all objects of the class would be made static. If we are writing a chess game and have a ChessPiece class that includes a method called movePiece, we would want to know how many moves a player has made, but not necessarily how many times a single piece has been moved. So, all of the ChessPieces share a numberOfTimesMoved instance data that is incremented by any ChessPiece whenever it is moved.

31) Write a static method that is passed two ChessPieces and determines if the two pieces are owned by the same player. It should return true or false.

Answer:
```
public static boolean samePlayer(ChessPiece p1, ChessPiece p2)
{
      return (p1.returnPlayer( ) = = p2.returnPlayer( ));
}
```

32) Define an interface class that contains two `int` constants, `X = 5` and `Y = 10` and one `int` method called `useXY` which receives no parameters. Call your interface class `XYClass`

Answer:
```
public interface XYClass
{
      public final int X = 5;
      public final int Y = 10;

      public int useXY( );
}
```