CSE 70
Midterm
Fall 2009

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Total _________ (77 points = 73 base points + 4 points EC [>5%])
1) More software projects have gone awry (failed) because of
   A. Lack of funding
   B. Lack of good software engineering tools
   C. Lack of testing
   D. Lack of manpower
   E. Lack of time

2) Probably the biggest drawback of the Waterfall Model is

3) What does it mean for a design (say, a group of classes) to have low coupling?
   A. Multiple classes are coupled by inheritance of implementation low in the inheritance hierarchy
   B. Multiple classes share a common set of "global" variables for low overhead communication
   C. Multiple classes rely on the inner workings deep ("low") inside each other
   D. Multiple classes are not dependent on each other; instead they use a public interface to exchange parameter-less messages (or events)

4) Upfront fully-defined requirements analysis is a big part of a Plan-Driven process like the Waterfall Model. One of the nice features of XP is there is no requirements analysis at all. True or False (Circle correct answer)

5) Which is considered a bad and undesirable design?
   A. High cohesion and low coupling
   B. High cohesion and high coupling
   C. Low cohesion and low coupling
   D. Low cohesion and high coupling

6) A Strict Layered architecture style exhibits which of the above?  A   B    C    D

7) Extreme Programming (XP) is considered an example of
   A. Layered Model
   B. The version of Windows before Vista
   C. Waterfall Model
   D. Spiral Model
   E. Agile Model

8) What does it mean for a design (say, a class) to have high cohesion?
   A. Methods in a class access data in other classes to provide the glue that ties the whole program together
   B. Methods in a class work together on a focused task
   C. Methods in a class are grouped together because they are frequently used methods (object management optimization)
   D. Methods in a class are grouped together because they provide the same basic function (like I/O)

9) A key method in the Strategy Pattern is a mutator method for each behavior variable. This allows us to
   A. Change behavior at compile time
   B. Change behavior in the interface
   C. Change behavior at run time
   D. Change state (behavior) in the object this variable is referencing
10) In a MVC architecture (Circle all that are true/correct) [+1 for each right answer/-1 for each wrong answer]
   A. The user only manipulates Controller(s)
   B. The Model may change independent of the Controller(s) changing the Model
   C. When the Model is changed, it is notified by the Controller(s) or View(s) that they changed it
   D. View(s) and Controller(s) can be hard to separate (ex: a text box is both a View & a Controller)
   E. The Model is highly dependent on the View(s) and Controller(s), but not the other way around

11) Objects maintain their own state via (Circle correct letter)
   A. Their superclass parts
   B. Their static variables
   C. Their instance variables
   D. Their local variables
   E. Their subclass parts

12) Interface defines ________ messages can be sent to an object while implementation defines ________
    messages are coded. (Use the words "how" and/or "what" to answer this question.)

13) The 4 main tenets/features of OOP are

   __________________________  __________________________
   __________________________  __________________________

14) Inheritance with a concrete superclass is an example of pure inheritance of ______________________.
Inheritance with an interface is an example of pure inheritance of ______________________.
Inheritance with a(n) ________________ superclass is an example of a mixture of the two types of inheritance.

15) ______________________ gives us an is-a relationship while ______________________ gives us a has-a
    relationship.

16) To realize the real power of dynamic binding
   A. A superclass reference must be a concrete class
   B. A superclass reference must be an interface
   C. A superclass reference must be an abstract class
   D. A superclass reference can be any type: interface, abstract class, or concrete class

17) In UML notation for access,
   public members are notated with a _______
   protected members are notated with a _______
   private members are notated with a _______

18) In UML, how is an interface type identified in a class diagram? (Not talking about inheritance here.)

19) You've just finished working on a new feature that required new files to be added to the project. What is/are
    the proper svn command(s) to make your changes available through the repository?
20) General OO Principles

__________________________ what varies.

Favor ____________________________ over ____________________________.

Program to ___________________________, not _______________________________.

Strive for ___________________________ coupled designs between objects that interact.

21) Design Patterns

__________ pattern defines a family of algorithms, encapsulates each one, and makes them interchangeable. This pattern lets the algorithm vary independently from clients that use it.

__________ pattern defines a one-to-many dependency between objects so that when one object changes state, all its dependents are notified and updated automatically.

22)
In the MVC architecture, which part(s) plays the Observable? ____________________________

In the MVC architecture, which part(s) plays the Observer? ____________________________

23) Which is usually considered the better design in the Observer Pattern?
   A. Push data to the Observer
   B. Push data to the Observable
   C. Pull data from the Observer
   D. Pull data from the Observable

24) In the following Java GUI/Event Handling code fragment:

```java
/* Some GUI control object that laying out GUI components */
JButton button1 = new JButton( "Stop" );
button1.addActionListener( new ResizableBall( /* args */ ) );

public class ResizableBall implements ActionListener
{
    /* Lots of other stuff associated with a ResizableBall */
    public void actionPerformed( ActionEvent evt )
    {
        /* Do something with evt */
    }
}
```

Which object is the Observable? ____________________________

Which object is the Observer? ____________________________

25) What UML notation indicates inheritance of implementation?
   A. Solid line with an open arrow (for example, )
   B. Solid line with a closed hollow arrow (for example, )
   C. Dashed line with a closed hollow arrow (for example, )
   D. Solid line with an asterisk at one end (for example, )
   E. Solid line with a solid diamond at one end (for example, )
26) Suppose you have the same database schema as from Lab 4 on SQL. The schema is as follows:

```sql
TABLE station(
    id INTEGER PRIMARY KEY,
    city CHAR(20),
    state CHAR(2),
    lat_n REAL,     --latitude coordinate of the station
    lon_w REAL      --longitude coordinate of the station
);

TABLE stats(
    id INTEGER REFERENCES station,
    month INTEGER CHECK (month BETWEEN 1 AND 12),
    temp_f REAL CHECK (temp_f BETWEEN -80 AND 150),  --average temperature in degrees Fahrenheit
    rain_i REAL CHECK (rain_i BETWEEN 0 AND 100),    --amount of rainfall in inches
    PRIMARY KEY (id, month)
);
```

Write the following query in SQL: List the city, state for the stations that recorded temperatures higher than 75 degF for any month from February through April (inclusive).

```
SELECT __________ , __________ FROM ____________ , ______________
WHERE ______________________________________ AND ____________________________
AND ________________ IN ( ____ , ____, ____);
```

27) For the following questions, assume that two people are editing the same file in their respective working copies of a project. Then, one of them commits their changes. Next, the other one tried to update their working copy.

Suppose each person's changes were on different lines. When the second person tries to update, what will SVN do?

Suppose each person's changes were on the same exact line(s). When the second person tries to update, what will SVN do?

28) I have an application that is in Tomcat/webapps/boogie; my uid is 666. How do I pass the value true for parameter isAwesome to the servlet mapped to the url pattern /midterm using an HTTP get?

A. http://ieng6-203:666?midterm=true
B. http://ieng6-203:666/midterm?isAwesome=true
C. http://ieng6-203:666/boogie/midterm/isAwesome=true
D. http://ieng6-203:666/boogie/midterm?isAwesome=true
29) The HttpSession object associated with the current user is stored in their web client.
   A. True
   B. False

30) In a Java servlet the ________ method is called when the user navigates to the URL. When you submit a
   form to the web page the client performs an HTTP ________, which is handled by the method ________.

31) Match the correct description with each term
   ____ Unit Testing   ____ Performance Testing
   ____ Integration Testing  ____ Acceptance Testing
   ____ Function Testing    ____ Installation Testing

   A) Test the system installed in the customer's environment in which it will be used.
   B) Test to verify the system component work together as described in the system and design specs.
   C) Test the system in a customer's working environment along with other HW and SW requirements.
   D) Test with the customer to make certain the system works according to customer expectations.
   E) Test each component on its own, isolated from the other components in the system.
   F) Test to determine if the functions described by the requirements specs are actually performed by the system.

32) White box testing (Circle all correct answers)
   A. Can always completely test an object in this manner
   B. Can usually choose representative test cases to follow each possible path through the code
   C. Can choose either black box or white box testing as long as the chosen testing is complete
   D. Uses the internal structure of the object being tested to devise test cases
   E. Statement-level testing is a stronger test than all paths testing

33) What UML notation indicates inheritance of interface?
   A. Solid line with an open arrow (for example,  )
   B. Solid line with a closed hollow arrow (for example,  )
   C. Dashed line with a closed hollow arrow (for example,  )
   D. Solid line with an asterisk at one end (for example,  )
   E. Solid line with a solid diamond at one end (for example,  )

34) Black box testing (Circle all correct answers)
   A. Can usually choose representative test cases to follow each possible path through the code
   B. Can choose either black box or white box testing as long as the chosen testing is complete
   C. Views the object being tested from the outside
   D. Just deals with input values and expected output values
   E. Can always completely test an object in this manner

35) Sequence diagrams
   A. details the order in which classes form an inheritance hierarchy
   B. details the order in which code blocks are executed with a particular input
   C. are interaction diagrams that shows how processes operate with one another and in what order
   D. show which parts of a program must execute sequentially vs. in parallel