

ICS52 - Introduction to Software Engineering
Second Midterm Exam – Winter, 2006

Last Name: _____ First Name: _____

Row: _____ Seat Number: _____

1. (15 points, 5 points each) Define the following terms, as used in software engineering:

A. Software Architecture.

B. Information Hiding.

C. Functional Decomposition.

2. (12 points) Joel Spolsky writes, "Design, for my purposes, is about making tradeoffs." Select two software qualities discussed in lecture or in the textbook (but not "high-quality", "on-time", or "inexpensive"), and describe how pursuing one quality might be detrimental to achieving the other. Discuss this tradeoff in the context of a specific software system, ideally one that has been mentioned in the textbook or lecture.

3. (12 points) Briefly describe two of the three main purposes of software architecture.

#1

#2

4. (15 points) In Homework 2, you wrote Class Interface Specifications. Describe how writing these exemplifies each of the following design principles.

abstraction

modularity

information hiding

5. (24 points) Consider an exciting new system called Multi-Language Instant Messaging (MLIM), which allows people who don't speak the same language to communicate. MLIM works like conventional Instant Messaging, except that each user selects his/her language from a drop-down box. Outgoing and incoming messages are automatically translated to or from the language of the receiver or sender, if necessary. Select two architectural styles described in the book or in lecture, write down their names, and for each style draw a diagram (*not* a UML class diagram) showing the MLIM architecture following that style.

Style #1: _____

Style #2: _____

6. (10 points) According to the Scientific American article "Command and Control," ATAMS was successful because it "combined several techniques that were shown years ago to produce better software faster." Name and briefly describe two techniques mentioned in the article, and explain which software engineering qualities, principles, or process models each technique illustrates.

1. First technique:

2. Second technique:

7. (3 points) The statements "We have to show something to our customer" and "We are judged by the amount of code written per person-month" and "We are pressed for time" are, according to the textbook, sometimes given as justifications for (choose the best answer)
- A. using the waterfall model.
 - B. programming in Java.
 - C. not spending time on design.
 - D. writing elaborate class diagrams.
 - E. using information hiding.
8. (3 points) Specialization in a class diagram usually corresponds to which keyword in Java?
- A. implements
 - B. public
 - C. private
 - D. abstract
 - E. extends
9. (3 points) A well-designed set of modules will usually have (choose one)
- A. loose coupling and high cohesion.
 - B. loose coupling and low cohesion.
 - C. tight coupling and high cohesion.
 - D. tight coupling and low cohesion.
10. (3 points) In the Model-View-Controller design pattern, the job of the Controller is to (choose one)
- A. determine which model executes first.
 - B. handle input actions.
 - C. store the data.
 - D. handle exceptions.
 - E. control the flow of data between the various views.