Final Exam CSE403 Spring 2006

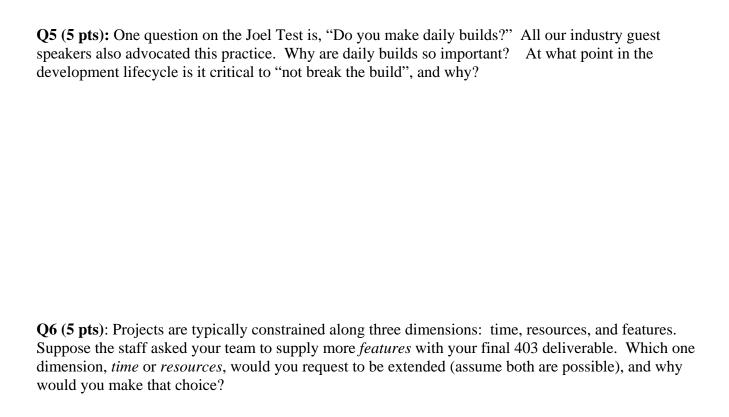
| | Question # | Value | Score |
|---------------|------------|-------|-------|
| | 1 | 10 | |
| | 2 | 5 | |
| | 3 | 10 | |
| | 4 | 5 | |
| | 5 | 5 | |
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| NAME: | 9 | 5 | |
| | 10 | 5 | |
| | 11 | 5 | |
| | 12 | 5 | |
| | 13 | 5 | |
| | 14 | 5 | |
| | 15 | 10 | |
| | 16 | 5 | |
| | 17 | 5 | |
| | 18 | 5 | |
| | Bonus | 2 | |
| Instructions: | TOTAL: | 105 | |

Instructions:

- Do not turn this page until instructed to do so.
- You may reference course textbooks and assigned papers. No electronic access, notes or slides.
- Please write legibly.
- Be sure to answer the question asked.
- As well as completeness, you will be graded on the quality of your answers. Provide reasonable support, including facts, references, and specific examples when applicable. We will be looking for solid understanding of the main concepts and ideas, and reasoning about how they interrelate.
- If you need additional space for any question, use the last page. Clearly identify the question to which the answer applies.

| Q1 (10 pts): Teams typically go through four stages: forming, storming, norming, and performing. Describe one situation your team experienced in each stage and explain how it illustrates the stage. |
|---|
| Forming |
| Storming |
| Norming |
| Performing |
| In retrospect, how might your team have reached the "performing" stage faster? |
| Q2 (5 pts): There are a number of reasons why it is important for life cycle architecture documents, including requirements, architecture, schedule, and risk documents, to be "living" documents. Describe <u>three</u> reasons. |

| Q3 (10 pts): Wayne Yamamoto discussed an internet media startup development model used by Merchant Circle that was a mix of code-and-fix and staged delivery. |
|---|
| a. Describe the code-and-fix aspect of the development model. |
| b. Describe the staged delivery aspect of the development model. |
| c. Name a major <i>benefit</i> of such a development model for the company, <u>and</u> a major <i>problem</i> of such a model for the company. |
| d. Given the Merchant Circle environment (small, little capital, internet media startup), how could you correct the problem you identified? If not, why not? |
| Q4 (5 pts): David Papworth, Intel Fellow, named 7 habits of Highly Effective Engineers: caring, sharing, responsibility, joy, growth, creativity, objectivity. Choose one of the habits and describe how you applied it to your activities during your 403 project. |



Q7 (5 pts): Asaph Zemach contrasted software engineering practices used at Cray and Google. He argued that the differences were necessitated by the different environments of the companies. Describe three aspects of a company that would influence its development practices. Briefly explain.

Q8 (5 pts): Create a use case for a grade database system. Describe the scenario of a student looking up her grade on a particular class assignment, using the template below.

| Goal | |
|----------------------------|--|
| Primary Actor | |
| Precondition | |
| Successful Postcondition | |
| Unsuccessful Postcondition | |
| Trigger | |
| Main Success Scenario | |
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| Failure Scenario | |
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Q9 (**5 pts**): How could you mitigate the risk of your software being out of sync with the customer's expectations? Describe actions that you would take to mitigate the risk throughout the product lifecycle.

| Q10 (5 p | ots): A system archi | tecture is often described | i using multiple view | S. | |
|-----------|-----------------------|---|------------------------|--------------------------|------------|
| a. Why | is this beneficial? | | | | |
| | | | | | |
| | | | | | |
| b. Name | e two ways to "view | " a software architecture | . Include an exampl | e to support your answer | ſ . |
| | | | | | |
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| | | On the Criteria to be use stem based on information | | stems into Modules," Pa | rnas |
| a. Descri | be a module in your | 403 project that was des | igned with information | on hiding in mind. | |
| | | | | | |
| | | | | | |
| | | | | | |
| h What v | value does this decon | nposition provide to the | develonment team? | Fo the company? | |
| o. What v | arde does this decon | inposition provide to the | de veropinent team. | to the company. | |
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Q12 (5 pts): Dennis Lee described how at Amazon, as well as other companies that build large distributed systems, they stress the importance of decoupling system components in their designs.

a. What does decoupling mean? Include an example (at a high level, using words or pictures) with your description.

b. Why is decoupling system components important to a company like Amazon?

Q13 (5 pts): Two schemas to describe a house and a car, which are unrelated except that both have a security system, are:

```
A. class SecuritySystem{...}
class House {
    SecuritySystem s;
}
class Car {
    SecuritySystem s;
}
```

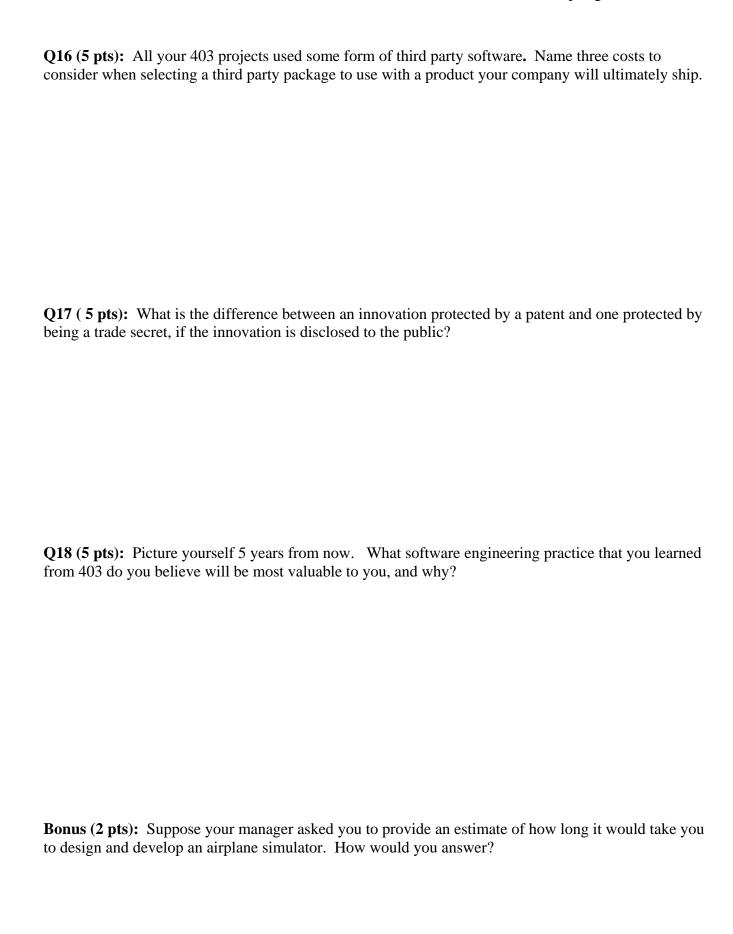
```
B. class SecuritySystem {...} class Object { SecuritySystem s; } class House::Object {} class Car::Object {}
```

A is an example of which design method?

B is an example of which design method?

Which is more appropriate to use for this situation, and why?

| tas | 14 (5 pts): Estimation of how long a task will take to be completed is notoriously hard. Consider the ks you personally did on your 403 project. Did you underestimate or overestimate the time to implete any of them? If so, describe the situation and how you might improve your estimates going ward. If not, describe the process you used to create your estimates, and why it worked so well. |
|-----|---|
| Q1 | 15 (10 pts): Refactoring is an important activity in engineering software. |
| a. | Identify a module, test, or tool that was developed as part of your 403 project that could use refactoring (or was refactored). |
| b. | Why is refactoring needed (why wasn't the code written differently initially)? |
| c. | What types of refactoring would you apply? |
| d. | What value would refactoring have to your company? |



Space below this point may be used to continue earlier answers. Please clearly label the question to which the answer applies.