Please answer each question only within the space provided for each question. All questions have equal points.

1. Explain the DRY, SRP, and OCP principles. What is the significance of each of these.

2. An object uses heavy weight resources that are expensive to create. You don’t want to create them unless actually needed. However, you want the creation of the resources to be seamless to the user of your object. What pattern will you use in this case? Explain.
3. What design principle is being used in the Strategy pattern. Show a UML diagram and explain how this principle is being applied. What is the benefit of this pattern and the use of this principle.

4. A programmer wants to inherit a Square from a Rectangle. While this may make sense mathematically, this inheritance may lead to problems. What design principle will be violated by such inheritance?

Principle most likely violated: __________________________________________

Explain, with an examples, how this principle would be violated.
5. In a library, a Node class represents an XML node like element, text, etc. A NodeList class represents a collection of Nodes. The library designer inherited the Node from the NodeList. Assume this is a reasonably good design move. Why would the designer do that? What would be the advantage? Do you see any pattern being used? Explain.

6. In the above design (question 5), if you want to navigate through each of the nodes in the node list, what design pattern you’d most likely use? Explain.
7. Explain the Execute-around-method pattern. Give an example of when you’d use that? What feature of a language makes implementing this pattern easier?

8. When would you be inclined to use an Adapter pattern? Between the two scopes of adapters, which one is more flexible and why?
9. What is the Singleton Pattern? How would you typically implement it? What are some of the issues in implementing this pattern?

10. I show you the design of a system. You are asked to say if the design is good or poor. How would you arrive at that conclusion? What will you be looking for in your assessment?
This page intentionally left blank. Whatever you write on this page will not be graded (no exceptions). Feel free to scribble on this page if you like, but don’t expect it to be graded.