RedId _____

Answer all 18 questions. Answer essay questions as briefly as possible.

The following might be names of patterns: Abstract Class, Abstract Factory, Active Object Model, Adapter, Application Controller, Bridge, Builder, Chain of Responsibility, Collaborator, Command, Composite, Decorator, Dependency Injection, Dynamic Factory, Façade, Factory Method, Flyweight, Interpreter, Iterator, Master-Slave, Mediator, Memento, Null Object, Observer, Prototype, Proxy, Singleton, Schema, Smart Variables, Specification, State, Strategy, Template Method, Value Object, Visitor.

1.  (2 points) What design pattern would you use to make it easy to change the implementation of an abstraction? Give only one pattern.

2.  (2 points) What design pattern would you use when you have a group of related objects that are designed to work together and you need to insure that they are used together? Give only one pattern.

3.  (2 points) What design pattern might you use when you wish to reduce tight coupling between classes? Give only one pattern.

4.  (2 points) What design pattern should you think of when you want to hide how you construct a complex object? Give only one pattern.

5.  (2 points) Which design pattern would you use when you want a client to create a new object without explicitly specifying the class of the new object? Give only one pattern.

6.  (2 points) What design pattern would you use when you have a class that you need to extend but do not want to subclass it? Give only one pattern.

7.  (2 points) What design pattern would you use to reduce dependence on hardware and/or software platforms? Give only one pattern.

8.  (2 points) Which design pattern would you use to alter a class when you do not have the source code for the class? Give only one pattern.

9.  (2 points) Which design pattern would you to reduce tight coupling? Give only one pattern.

10. (2 points) Which design pattern would you use when you want to specify at runtime which method to use to satisfy a request? Give only one pattern.

11. (10 points) Circle the correct answer for each of the following.

    True    False    The facade pattern is used to lower coupling between different subsystems.

    True    False    In the chain of responsibility a request will be handled.

    True    False    The abstract factory pattern promotes consistency among products.

    True    False    The flyweight pattern is used to save storage when you have large sized objects.

    True    False    Template methods lead to an inverted control structure.

    True    False    In implementing an abstract factory the singleton pattern is often used.

    True    False    The mediator pattern requires the abstract Mediator class.

    True    False    The prototype pattern can reduce subclassing.

    True    False    The singleton pattern permits a variable number of instances.

    True    False    The decorator pattern often results in a system composed of lots of little objects that all look alike.

12. (10 points) The Template Method, Factory Method and the Abstract Factory are related. Besides being creational patterns how are the three related?

13. (10 points) Explain how the Chain of Responsibility pattern works.

14. (10 points) Some design patterns can be described as changing the skin of an object others can be described as changing the guts of an object. What design pattern(s) would be considered changing the skin of an object?

15. (10 points) The Proxy, Bridge and Adapter share a similar structure. What is the difference between the patterns?

16. (10 points) Design patterns have consequences, some good and some bad.

    a.  Give one good consequence of the Decorator pattern.

    b.  Give one bad (or negative) consequence of the Decorator pattern.

17. (10 points) In the Composite pattern one can place the child management operations (add, remove) either in the Composite class or the Component class. What are the trade-offs of putting them in the Component class?

18. (10 points)
    a. What is the difference between an object adapter and a class adapter?

    b. What is an advantage of an object adapter over a class adapter?