

Name: _____

CS3733 Midterm Exam

1. [6 pt] Define Coupling with respect to objects:

[6 pt] Which form of coupling is better and why? **Common Coupling** or **Data Coupling**

2. [15 pt] Match concepts with their definition:

- (1) Suppressing unnecessary details and highlighting relevant details.
- (2) When a method can be applied to objects of different classes.
- (3) A working model functionally equivalent to a subset of a product.
- (4) Gathering together into one class all aspects of a real-world entity modeled by that class.
- (5) Suppressing implementation details of a class from other classes.

- (a) Information Hiding ___
- (b) Encapsulation ___
- (c) Rapid Prototype ___
- (d) Abstraction ___
- (e) Polymorphism ___

3. (a) [16 pt] What are two strengths of the **Waterfall Life Cycle**, and two weaknesses:

S1:

S2:

W1:


W2:

(b) [8 pt] What is a strength of the **Recursive/Parallel Life Cycle**, and one weakness:

S1:

W1:

(c) [4 pt] Which of these Life Cycles would you employ to develop the software for a Nuclear Power plant, and why?

4. What is wrong with the following requirements?
- (a) [5 pt] When the Command Module sends a request to the Database, it processes it.
- (b) [5 pt] If the Gross Salary is less than \$20,000, the tax rate is 10 percent. If it is greater than \$19,000, it can be found in the green Tax Table on page 42.
5. [16 pt] Consider the **Bounded Stack** class. This class has operations to *create(int MAX)* a stack of MAX elements, *push* and *pop* elements from a stack. There can never be more than MAX elements in the stack at any time. What is the behavioral model of an object of the **Bounded Stack** class?
6. (a) [16 pt] Consider the following geometrical entities: Triangle, Square, Polygon, Isosceles Triangle, Rectangle, Equilateral Triangle, Parallelogram, Trapezoid. Construct a Generalization/Specialization Class Hierarchy to model these geometrical constructs.
- (b) [3 pt] Where does Star () fit in?