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?