1. (a) [10 pts.] Identify a strength of the **Incremental Model** and one weakness. Explain.
   S1:
   
   W1:
   
   (b) [10 pts.] Identify a strength of **Rapid Prototyping** as a Specification Technique and one weakness. Explain.
   S1:
   
   W1:
   
   (c) [5 pts.] Which life cycle model has less interaction between client and developer: **Spiral** or **Recursive/Parallel**? Explain.

2. [6 pts.] Fill in the blanks using the words: Implement, Interface, Method.
   A/An __________ specifies a set of __________s for a class. A class can __________ multiple __________s, but each __________ belongs to exactly one __________.

3. [10 pts.] What are two impacts of unnecessary object coupling?
   I1:
   
   I2:

4. [6 pts.] Explain how Class/Responsibility/Collaboration (CRC) diagrams can help identify subsystems.

5. [6 pts.] Can **Stamp Coupling** ever occur when passing objects as arguments in a message? For example, `object1->method (obj2)`. If so, explain how. If not, explain why not.
6. [16 pts.] Consider the PartSortList class. This class has operations to create() a PartSortList. append(element) adds an element to the end of the List, remove(element) removes an element from the List, if it exists. insert(element, n) inserts an element to be the nth element in the List; if n > number of elements in list, the element is added to the end of the list. sort() sorts the elements in the List. What is the behavioral model of an object of the PartSortList class?

7. [16 pts.] Match concepts with their definition:

(1) The ability to reuse existing modules
(2) The feature that changes are localized to individual modules
(3) Suppressing implementation details of a module from other modules.
(4) The ability to handle error conditions within a module without revealing the details to other modules.

_____ (a) Modular composition  _____ (b) Information hiding
_____ (c) Modular protection  _____ (d) Modular continuity

8. (a) [12 pts.] Consider the following mathematical entities: Real Number, Irrational Number, Odd Integer, Even Integer, Natural Power of 2, Integer, Positive Integers. Construct a Generalization/Specialization Class Hierarchy to model these mathematical constructs.

(b) [3 pts.] Where does Prime Number fit in?