# Problem Analysis and Solution requirements

Examination 29th January 2010

Keep your answers precise: short and informative.

1. Which of these problems are practical problems, and which are knowledge problems? Explain your answer.
- **P2** Select and implement a logistic financial package with an eye to future IT developments
- **P3** Find out how the value chain of the Greenery can be improved to deal with growing competition. (The Greenery is a cooperation of 7000 vegetable & fruit farmers, which owns 70 different companies in this value chain.)
- **P4** Design an architecture for exchange of information about diagnosis-treatment combinations (DTCs) among insurance companies and hospitals.

2. "Software requirements are *what* a SW system must do, SW design is *how* it must do it." Explain what is wrong with this statement.

3. Explain each task in the engineering cycle and indicate what role the engineering argument plays.

4. Explain the difference between a feature, advantage and benefit.

5. Suppose in a property definition tree, the property *Usable* has been operationalized as *Learning time for new users is less than 30 minutes* and *Number of user calls to help desk is less than 1 per 10 hours of usage time*. Does this mean that these two variables have a causal relationship with the variable *Usable*? Explain your answer.

6. What is the difference between a state goal, a procedural goal, and a state-defined activity goal? Illustrate your answer.

7. What is the difference between a goal and a preference? Explain your answer.

8. What are the two meanings of "Why is this a problem?"

9. What are the two parts of a treatment theory? Illustrate your answer with an example.

10. The following diagram shows a causal graph of delivery in a value chain.
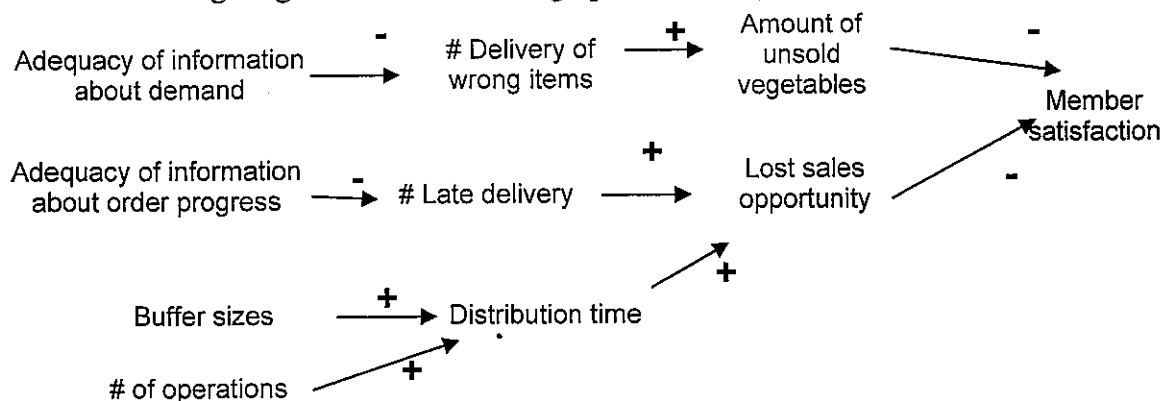
(a) Explain the meaning of the + and − annotations of the arrows?

(b) The graph as a whole represents a set of mechanisms. What is the role of assumptions made about the context in the generalizability of the graph? Explain your answer with an example from the graph.

11. Problem investigation can be (a) problem-driven, (b) goal-driven, (c) solution-driven and (d) impact-driven. Explain this, and give an example of the engineering argument in each of these cases.
12. Explain what is the difference between a unit of data collection and a unit of study; illustrate your explanation with an example.
13. Can we use both statistical generalization and mechanism-based generalization to generalize from one case study? Illustrate your answer by an example.

Points:

1	2	3	4	5	6	7	8	9	10a	10b	11	12	13
9	5	8	6	6	6	6	6	6	6	6	8	6	6

Exam Grade = (10 + Points) / 10