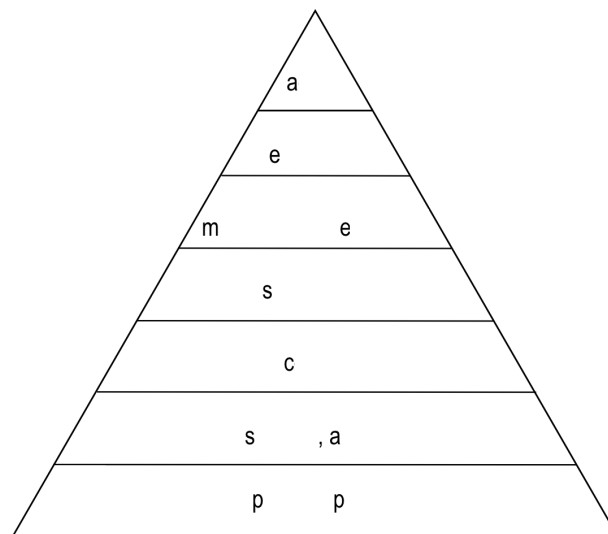


## Exercise Sheet: Week 1

### Question 1

- a) Complete the layers of the automation pyramid.



- b) On which layer of the pyramid is the schedule of the production of different chemicals in a pharmaceutical plant created?
- c) What are the three functions of the operator interface? To which layer does this belong?
- d) On which layer are production goals set, sites coordinated, orders managed?

### Question 2

- a) What is the relationship between hierarchical level, the response time, data quantity and complexity?
- b) What does that imply for the communication networks?

### Question 3

Give a high-level description of the architecture up to the supervision level of a home user washing machine (ignore communication networks in this exercise, assume that components can exchange information using some advanced magic).

- a) What are the main components of such a washing machine? Give each component a name and describe in 1-2 sentences its functionality
- b) To which layers do the components and their parts belong?

- c) Describe the interaction between the components in 0-2 sentences per pair

**Question 4**

- a) Which parts of a washing machine are discrete, and which are continuous?