1. In Activity theory there are five constructs that are used to understand an activity. Describe three of these constructs and exemplify how they are used. 6p

- **Object-orientatedness**, you look for objects to study, could be people, theories, models, ideas.
- **Mediation**, what tools are needed for activities to take place? Could be physical or mental.
- **Hierarchical structure of activity**, an activity is described with abstraction levels, the overall activity, and the actions that have to be performed which are performed consciously, finally the operations that are more of an unconscious action, without goals of its own.
- **Internalisation – externalisation**, external activities such as calculation might be internalized, and the other way around. Transforming activities from internal to external should be considered.
- **Development**, might happen when breakdowns occur, they are prerequisites for development, when people move their knowledge level one step further.
2. Use The Distributed Cognition framework to describe the activity of shopping groceries at the grocery store. Relate what you describe to the cornerstones of the framework. 5p

- **Redundancy** – *price displayed on the shelves, in the scanner, on the receipt. What can be observed? Shopping list, total sum, prices displayed when paying or in the scanner. Computations might be necessary, is there enough money on the account (or in the purse), could be performed in the head or in a scanner or with other tools. Prices are available in certain “stations”. Often we also need other people to ask where to find certain groceries, if they are out of milk for instance. Information and computation is thus **distributed.** Etc.*
3. Give an example of how a Strategies Analysis helps while making decisions about the design of a system of your choice. 3p

Has to do with analysing a number of solutions and relating them to certain circumstances. The system should then support the most suitable one considering the circumstances.
• 4. Describe all necessary steps in one of the task analysis processes. Consider the origin of information about relevant tasks, i.e. where might the information come from. 6p

• *Task analysis methods are GOMS, HTA, KLM*

• *Data origin: observations, former studies etc.*

• a certain task

• how it is accomplished

• *described according to the method*

• *decide time taken – in GOMS and KLM*
• 5. Account for the process of using Design Rationale and the purpose of the steps included. Where is its place in the design process, i.e. how does it relate to other activities or steps in the design process? 6p

• *First scenarios are chosen and described in narratives, from these scenarios claims are generated, and the analysed. Many theories could be used in the analysis. DR depends on gathered data and results in design proposals.*
6. What roles does the designer take in a Participatory Design approach? 4p

- coordinate activities
- facilitate discussion
- prepare materials
- advocate solutions
• 7. In certain applications the user interface consists of elements that are representational artifacts, such as histograms. What aspects of such an artifact (a histogram) should be covered in the user interface in order to map a plausible mental model of this artifact? 5p

• The axes should have names and scales, intervals. The user might want to colour the bars or give them a pattern. A title of the histogram is desirable
• 8. Account for the contributions that formal methods result in that other methods do not capture. Illustrate your answer with an example. What is missed when formal methods are not supplemented with other methods or perspectives? 6p

• Formal methods do not consider the content of what is described. Therefore we can analyze behaviour in a formal way, measuring time, identifying state transitions, etc. If we look at how to control functions in a watch, we can see the possible transitions that exist, and even possibly see that some transitions are not designed, but should be designed. The formal analysis does not take into account the context and content, but this is often required to make reasonable decisions about design.
• 9. The lowest level of visual perception is called early vision. Account for how knowledge related to this level might be used in the design of user interfaces. 4p

• *Things that belong on this level is how we react to different colours, movements, and shapes. Has to do with how people pay attention to something. This can be accomplished with motion, but you can also make an object stand out using an attribute that no other objects have. Colour is more efficient than shape.*
10. Account for an evaluation session based on Guiard’s two-hand model of interaction. What should be in focus of such an evaluation? How can the session be conducted? 5p

Observation is the evaluation method to be used here. We should construct data that cover many different cases, of course, the routine tasks they perform, but also things that are exceptions to routine work. The tasks should also ensure that the data cover all types of interaction devices, i.e. all types of keys in a keyboard, both (all) buttons on a mouse and so on. This is necessary in order to identify possible problems with the hands’ positions and the possible need to frequently move the hands to carry out their functions.