

# Große Übung Computer Networks

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Knowledge Acquisition so far...

# Chapter 1: some Questions

1. What is a Computer Network
  - a. as opposed to a BUS?
  - b. as opposed to a Terminal Network?
2. What groups of standardization organizations exist?
3. Why is standardization especially relevant for Computer Networks?
4. How and why can a communication system be structured into layers?
5. Draw and label a picture of three nodes running an ISO/OSI stack (a-b-c) and fully explain the consequences of an e-mail sent from a to c!
6. Explain the following words: layer, protocol, service, service primitive!
7. Draw and label of an ISO/OSI stack side-by-side to a TCP/IP stack such that corresponding layers are on the same level. Describe similarities and difference.
8. Discuss the differences between OSI and IP, both of the reference model and the actual protocols.

# Chapter 2a: some Questions

1. You are able to define and explain the function of the Physical Layer!
2. You can classify time-dependend signals and name, sketch, and explain examples!
3. What is the purpose of line coding? What are the problems when transmitting with electricity? What are desirable properties of line codes and why?
4. You know all the line-codes of the slides by heart, can code and decode in them and can compare every two of them according to their features.
5. Explain the difference between bit and baud rate!
6. Explain the terms modulation and modem!
7. Name and explain the three modulation techniques from the slides, including drawn examples.
8. Explain multiplexing in the context of transmission paths/ channels!
9. Explain FDM, the two flavours of TDM and discuss the pros and cons!
10. Explain the fundamental advantages of transmitting data digitally.
11. Explain the fundamental steps of Digitalization.
12. Explain sampling and Nyquists's Theorem using self-drawn examples.
13. Explain Quantization, Quantization error and PCM giving an example.
14. Explain Delta Modulation, PCM and ADPCM!

# Chapter 2b: some Questions

15. Explain the difference between synchronous and asynchronous transmission. Give an example for both!
16. Make a complete figure with explanation of a System as described on Slide 2a-54 transmitting the number sequence 7-2-8-1 from a to b.
  1. You are able to name, sketch, and describe the topologies shown in the slides! Furthermore, you can compare them w.r.t. e.g., fault tolerance, cost cable length etc..
  2. You can explain the basic cable types featured in the slides. Also, you can in principal compare electrical vs. optical cabling.
  3. What are the special properties of Satellite Communication, Wireless LAN, Bluetooth, and Cellular Networks like UMTS/GSM, what are the advantages and disadvantages.
  4. How does the physical Layer of V.24 work - in principal?
  5. What do members of the xDSL protocol family have in common, how do they work in principal? Make a sketch of the system from Internet to Home.
  6. Compare the members of the xDSL family.
  7. Why is ADSL asymmetric?
  8. Explain QUAM using a self-made diagram. How is it possible to get multiple bits per baud?
  9. How does CAP work, how DMT?