

S-72.423 Exercise 2.

Return your answer no later than on Tuesday 26.10.2004 at 16:00 into the course's P.O. box at the third floor of the E-wing.

Please, include the following information in your answers:

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- Your name (+ team member names)
- Your student number (+ team member student numbers)

It may be that you won't find answers to the questions straight from the lecture material. You may have to look for information from the textbooks and Internet. Good luck for information search!

To this exercise you may answer in English, Finnish or Swedish.

1. ISDN, SS7, ATM, SDH : True or False?

- a) ISDN: For example Video-telephony is typical supplementary service.
- b) ISDN: Primary rate Access consist 32 digital B channels.
- c) Signalling: When using CAS, setting up a circuit switched connection is very fast.
- d) Common Channel Signaling (CCS) is divided into line and register signaling.
- e) When using common channel signalling (CCS), end-to-end signalling is possible after call setup.
- f) In SS7 link status signal unit contains signaling messages for link supervision.
- g) FISU means Fill-In Signal Unit.
- h) ACM – Address Complete Message is sent from USER B to USER A.
- i) Charging of the call starts when ANM message is received at LE A.
- j) Signaling is needed when ATM's Permanent Virtual Circuits are established.
- k) ATM cells can be carried in an SDH virtual container (e.g. VC-4).

2. Answer shortly:

- a) How and why FISU can be used to monitor quality of signalling link?
- b) Give an example of an IN (Intelligent Network) service where address translation is used.
- c) In an ATM switch, ATM cells are transported from an incoming logical channel to one or more output logical channels. Describe how a logical channel is indicated.
- d) Why and how is ATM Adaptation Layer 5 (AAL 5) used?

3. Let us assume that compressed digital speech with a bit rate of 14 kbit/s is sent over an ATM link (cell bit rate = 150 Mbit/s) using AAL 1.

- a) What is the packing delay at the sending side of the ATM link when each ATM cell is fully packed?
- b) Is there a similar delay at the receiving side of the ATM link?
- c) What is the packing efficiency when the packing delay is not allowed to exceed 10 ms?
- d) Explain briefly, how packing efficiency can be improved by using AAL 2.

4. The figure below presents the signalling during the establishment of a circuit switched call from a subscriber behind an analogue line in the PSTN (User A) to a subscriber behind a digital ISDN line (User B). Your task is to shortly describe the numbered functions (in other words “what is going on”) and why these functions are needed.

