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Guidelines for the examination paper in Telecommunications Economics. Winter 2010 - I, date 18.12.2009.

Criteria for top performance in assessments of examination in 'Telecommunications Economics'.

To obtain the highest grades in the assessments of examination in 'Telecommunications Economics' the following general criteria shall be met:

The student shall

- *demonstrate knowledge of all the relevant concepts and factual items regarding the questions raised and of the relationships between these*
- *be able to design an analysis to give a thoroughly description of the problem and find possible solutions to the questions raised*
- *give a survey of the relevant economic issues regarding the questions raised*
- *explain constraints and uncertainties in the presented solutions, often in the form of trade-offs between different objectives.*

As more concrete criteria - depending on the actual questions raised in the examination - the following shall be demonstrated:

Knowledge of

- *the main trends and relationships in the ICT sectors (ICT=Information and Communication Technology) regarding demand, supply, prices, market players, technical solutions, regulation etc.*
- *the main economic and technical concepts and items used in the ICT sectors, especially for telecommunication, the Internet and supply of radio and TV channels.*

The minimum criteria for passing the examination.

The student shall demonstrate knowledge of

- *the most important concepts and factual items that are relevant for answering the questions raised*
- *the most relevant trends and relationships in the ICT sectors*
- *the possibilities and limitations of the use of relevant economic analyses.*

Acceptance of a limited amount of small and medium failures in the analysis presented, but normally no major failures can be accepted.

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Question A.

There are different ways to answer the question. It is important to show an understanding and overview of different relevant concepts and to organise the presentation in a well-structured way.

The answer should include several of the following issues:

- The principle of circuit-switched technology for fixed telephony: a channel from A to B is reserved for the call during the whole time that the call is going on. All bits that represent the call are transported in that channel.
- The principle of packet-switched technology for fixed telephony: all the bits for the call are collected in packets; these packets can travel different ways from A to B and they are reassembled in point B. In a given channel from A to B packets from many different calls can travel in the same time period when a call is going on. Thereby an increase of capacity is obtained.
- The problem with delays and other failures for packet-switched technology => the concept of QoS.
- The importance of delays for different applications.
- The capacity constraint in a packet-switched regime: either build more capacity or prioritize applications.
- To guarantee QoS within a given route from A to B: reserve channels for delay-intolerant applications. Thereby the increase of capacity (bullit two), however, is more or less lost, and the financial outcome is like the use of circuit-switched technology.
- The use of the IP protocol for voice, data and TV. Different requests regarding the technical characteristics for the network need to be fulfilled.
- The possibility to obtain economies of scope by common use of the IP Protocol for all the applications.

Question B.

There are different ways to answer the question. It is important to show an understanding and overview of different relevant concepts and to organise the presentation in a well-structured way.

The answer should include several of the following issues:

- Explain who pays for what in a CPP and a RPP regime when a call is taking place between two different networks.
- The rationale behind CPP versus RPP: who is the originator of the call, who obtains utility?
- The incentives for the customers in the two regimes and thereby the connection to the penetration of mobile telephony. The experience in Europe and US/Canada.
- The difference between calls between fixed and mobile networks versus between two mobile networks: The different levels of termination fees and the money transfer from fixed networks to mobile networks.
- Explanation of the need for regulation of mobile termination fees in a CPP regime.
- The “Waterbed effect” when mobile termination fees are regulated in CPP countries.
- The connection between a RPP regime and “Bill and keep” rules for interconnection. Comparison with the Internet.