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Guidelines for the examination paper in Telecommunications Economics. Winter 2016-2017, date 22.12.2016.

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 shall include several of the following issues:

- Present different sources of revenue: subscribers, advertisers, other networks.
- Describe the value chain consisting of terminals, networks, customer service and content. Describe telecom operators with their own network, pure service providers, OTT players, cloud suppliers and content producers, and how they get revenue for their business.
- Who pays to who between networks: Interconnection of voice, data and content. Old and new regimes. Commercial negotiations and regulatory decisions.
- Present different price schemes for end-users. Flat rate and usage based.
- Present the cost structure: Fully Allocated Costs (FAC) and Variable Costs (VAC).
- Discuss the challenge to cover the huge fixed cost for network operators and content producers, because prices for different reasons are approaching marginal cost (Bertrand).
- Discuss the challenge of piracy, file sharing and free riding.

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 shall include several of the following issues:

- Describe the purpose and the functionality of an IP address.
- Present the challenge of the scarcity of IPv4 addresses.
- Define standards of IPv4 versus IPv6 and discuss compatibility problems.
- Present incentives for the different network operators (ISPs and IBPs) for making the change. How are the benefits and costs?
- The governance of the Internet: IANA (managed by ICANN) plus five Regional Internet Registries (RIR) for North America, Europe + Middle East, Asia-Pacific, South America and Africa.
- Challenges for all related sectors that rely on the use of the internet.