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**Guidelines for the examination paper in Telecommunications Economics. Winter 2010/2011, date 21.12.2011.**

**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 Digital Agenda for Europe and the NGA Recommendation from the EU Commission. The political objectives at the EU level.
- The 4 broadband access forms for the next 10 years: copper, coax, fibre and mobile wireless (3G/4G).
- The characteristics of the alternatives FTTN (Fibre-to-the-node) and FTTH/FTTB (Fibre-to-the-home/Fibre-to-the-building) - P2P and GPON.
- Scenarios for the development in the telecommunication sector the next 10 year. Two main assumptions: A) FTTH + complementary 3G/4G will be the winner; or B) 4 competing broadband access forms with moderate penetration rates for all 4 forms.
- Business strategy for big operators in the telecommunication sector in relation to NGA: investment incentives, risk, pay-back times, spread in penetration of customers in different geotypes (cities/rural) etc.
- Demand from customers and willingness to pay for FTTH compared with copper and coax solutions. Flat rate price schemes.
- Complementarity or substitution between wireline and mobile wireless broadband access.
- Regulation of wholesale prices for bit-stream-access (BSA) for copper, coax and fibre as cost plus. How to include risk?

### 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:

- The impact on lifestyle from mobile telephony in the last two decades in European societies.
- Demand for both mobile voice telephony and mobile broadband access.
- Characteristics for 1G, 2G, 3G and 4G (analogue/digital and "circuit switched/packet switched). Increase in bandwidth. The functioning of mobile telephony with "seamless handover" between masts. Roaming. Coverage with different frequencies.
- Allocation of spectrum to mobile operators either by a beauty contest or by an auction. Pros and cons for both.
- Different design of auction rules.