TLT-6506 Digital Mobile Communication Systems
Final exam, 28.11.2005

1. Describe the architecture of the basic GSM system in a general level. Explain the purpose of each element briefly. Use illustrative drawing. How did the architecture change as packet data services were introduced?

2. Adaptive Multi Rate (AMR) speech codec is standardized for both GSM and 3G WCDMA. Describe how AMR is used GSM, what are its key features of it and its advantage over other GSM speech codecs. Finally, describe how AMR is used in WCDMA system.

3. Handovers and power control are common methods to manage radio resources in any mobile cellular system. Describe how they are implemented in GSM.

4. Answer briefly:
    a) What is the difference between channelisation and scrambling code in WCDMA?
    b) What are the differences between hard, soft and softer handover in WCDMA?
    c) What kind of interference scenarios exists in a TD-CDMA system and why?
    d) Why it is essential to have fast power control in WCDMA?
    e) What does it mean that the channel is *reciprocal* in TD-CDMA?
    f) What is the main function of Adaptive Modulation and Coding (AMC) in WCDMA HSDPA (High Speed Downlink Packet Access)?