

PRINCE OF SONGKLA UNIVERSITY  
FACULTY OF ENGINEERING

Final Examination Semester II : Academic Year : 2004  
Date : 26 February 2005 Time : 13.30 – 16.30 Room : R300  
Subject : 240-544 Telecommunication, Wireless and Mobile Networking

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**Instruction:**

- Make sure that there are 5 questions in your exam paper.
- This exam is **closed book** and you have 3 hours to complete your exam.
- All of your answers can be written in Thai or English.
- Dictionary and Calculator are allowed.
- No palm pilots or other hand held computers are allowed.

**1. Wireless Local Area Network: IEEE 802.11**

- a) Provide a detailed description of how IEEE 802.11 MAC works. (5 points)
- b) How does PCF/DCF coexist? (5 points)

**2. Mobile IP**

- a) It is possible for a mobile node to use its home address on a foreign network (i.e. to not have a valid local address). Explain how this is possible, how the mobile unit finds the FA and how the home-address is treated on the visited network! (10 points)
- b) Describe in detail what happens when another computer on the host's home network sends a network packet to the roaming client and when a reply is sent back! (5 points)
- c) What is an AAA server? (5 points)

**3. WLAN and Ad-hoc networks**

- a) Explain briefly the difference between Dynamic Source Routing (DSR) and Destination-Sequenced Distance Vector (DSDV) used in wireless ad-hoc networking. (5 points)

- b) Discuss the impact of routing overhead on AODV. (5 points)
- c) Ad-hoc routing protocols may be reactive instead of pro-active. Explain the difference between a reactive and pro-active routing protocol. What are the advantages with the two methods? (10 points)
- d) WLAN networks can be built either in Ad-hoc mode or in Basic Infrastructure mode. What is the difference? (5 points)

#### **4. TCP in wireless environments**

Two big issues for TCP in a wireless environment are 1) fluctuations and shrinkage of the window size, and 2) coarse-grain timeouts.

- a) What are the causes of each of these problems? (5 points)
- b) Specifically, how does each problem affect the connection's performance? (5 points)

#### **5. Miscellaneous**

- a) Based on the paper "Improving End-to-end Quality of Services in 3G Wireless Networks by Wireless Early Regulation of Real-time Flows", describe the key concept of proposed mechanism, including the router mechanism that is used to regulate non-real time (best-effort) flows. (5 points)
- b) Based on the paper "iSMS: An Integration Platform for Short Message Service and IP Networks", describe why the proposed system does not require any modification to the Mobile Telephone Network in order to deploy its SMS-based services. (5 points)

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