PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Final Examination Semester II : Academic Year : 2006
Date : 23 February 2007 Time : 9.00 – 12.00 Room : ~~R200~~ A301
Subject : 240-544 Telecommunication, Wireless and Mobile Networking

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Instruction:

- Make sure that there are 5 questions (110 points) 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 and diagram of how the IEEE 802.11 MAC protocol works. (10 points)

b) In the IEEE 802.11 network, explain why the time-bounded services using PCF (Point Coordination Function) mode is considered having QoS limitations. (10 points)

c) In the IEEE 802.11e, describe how Enhanced Distributed Coordination Function (EDCF) for the contention period can provide service differentiation (or relative priority classes). Also, use brief diagrams to support your explanation (10 points)

2. Bluetooth

a) Describe the objective of inquiry in Bluetooth networks and explain its operation together with drawing to support your explanation. (10 points)

b) Describe the collision avoidance mechanism used in Bluetooth networks. (10 points)

c) Suggest the type of link that can be well supported for voice communication between a master and a slave in a piconet **and** also give the reasons to support your idea. (10 points)

3. 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)

4. 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. (10 points)

b) 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)

c) WLAN networks can be built either in Ad-hoc mode or in Basic Infrastructure mode. What is the difference? (5 points)

5. Research Paper

Based on the Wireless Network mechanism that you have been assigned to work for in the class, please pick only ONE topic and describe in detail on the issues as follows:

- Weakness or problems that the authors attempt to handled or solved.
- The key concept of proposed mechanism

(10 points)

a) An implementation of Wireless Sensor Network for security system using Bluetooth
b) SIP Security (in general or Wireless Network in specific)

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