ECE 750-4 Final Exam, Spring 2004

ECE 750-4 – Protocols, Software and Issues in Mobile Computing

Instructor: Sagar Naik

August 06, 2004, 2:30 PM—5:30 PM

Notes

- **You have THREE hours to complete the exam.**
- **This is a closed book exam. You may use a calculator.**
- **Continue your answers on the back of the facing page, if necessary.**
- **Answer all questions, and hand in all pages.**

GSM + Channel Assignment	**/25**
Ad Hoc Networks	**/25**
Broadcasting Techniques	**/25**
Mobile IP	**/25**
WAP	**/25**
Environment Awareness	**/25**
Peer-to-Peer Communication	**/25**
Total	**/175**

Student ID **Student Name** **Student Signature**

1. GSM + Frequency Assignment 25

a. [10] Explain the inter-BSC, intra-MSC handover process in the GSM system using typical signals and a message sequence chart. Explain the decision points and the resource allocation steps, if they exist.

b. [5] Explain the Geometric dynamic channel assignment algorithm.

c. [10] State and explain *four* techniques for improving the performance of dynamic channel assignment algorithms.

1. GSM + Frequency Assignment

2. Ad hoc networks 25

a. [15] Explain the *destination-sequenced distance vector* (DSDV) protocol for constructing an ad hoc network.

b. [10] Explain a routing protocol for ad hoc networks that uses position information. Discuss the limitations of the protocol.

2. Ad hoc networks

3. Broadcasting Techniques 25

a. [10] Explain in detail the *distance* based broadcasting technique.
b. [15] Explain in detail the *dominant pruning* algorithm for broadcasting.

3. Broadcasting Techniques

4. Mobile IP 25

a. [10] Explain the idea of *agent discovery* in mobile IP.
b. [5] Explain the idea of *move detection* in mobile IP.
c. [10] Explain the idea of *registration* and *deregistration* in mobile IP.

4. Mobile IP

5. WAP 25

a. [15] Explain the three classes of Wireless Transaction Protocol.
b. [10] Explain the needs for having three classes of WTP.

5. WAP

6. Environment Awareness 25

Assume that your have been hired by a major software development company located in Seattle with the responsibility of redesigning their operating system such that an application provides the "best" service to the user depending on the quantity of available resources on a modern-day laptop. Explain the necessary updates to be made to a standard OS, the need for any middleware, and the required structuring of application programs to take advantage of the new functionalities provided by the OS and the new middleware.

6. Environment Awareness

7. Peer-to-Peer Communication 25

a. [10] Explain the idea of *caching* and *replication* in peer-to-peer networks.
b. [15] Explain three *searching techniques* in peer-to-peer networks.

7. Peer-to-Peer Communication