



Student Name:.....

## Mobile Commerce

June 19, 2003

### FINAL EXAM

Vrije Universiteit Amsterdam

**IMPORTANT NOTICE:** This is a **closed book** exam. You are supposed to answer the questions on your own, i.e. without the use of a computer, books or any other material and without discussing the exam with anyone else. Cheating will not be tolerated and will be handled according to strict University policies.

This exam has been designed to test your overall knowledge and understanding of the material covered in the course so far. It consists of **a total of 6 questions for a total of 100 points**. Please make sure to answer in the space provided under each question. Answers will be evaluated based on content rather than length. In other words, there are no extra points for providing long answers.

This exam is not meant to be stressful and should not take you more than an hour to complete. You are however given a total of two hours to answer the questions. **Please make sure that your handwriting is legible and that you have printed your name at the top of each page. Good luck!**

Student Name:.....

Student ID Number:.....

#### Score:

1      \_\_\_\_ / 15

2      \_\_\_\_ / 10

3      \_\_\_\_ / 25

4      \_\_\_\_ / 10

5      \_\_\_\_ / 25

6      \_\_\_\_ / 15

\_\_\_\_ / 100

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**Question 1: Transition to 2.5G and 3G (15 points):**

The transition to 2.5G and eventually 3G technologies is viewed as critical to the broad adoption of mobile commerce. Identify 3 key characteristics of these technologies that should help in this regard. Limit your answer to 2 or 3 sentences per characteristic, including an explanation of why/how it is expected to help.

1.

2.

3.

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**Question 2: WiFi (10 points):**

Question 2a (6 points): Identify 3 factors that could make WiFi a better solution than 3G. Limit your answers to 2-3 sentences per factor

1.

2.

3.

Question 2b (4 points): Identify 2 sources of concern about WiFi security. Limit your answer to 2 sentences per source.

1.

2.

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**Question 3 (25 points): WAP Security**

Question 3a (10 points): Why do people say that the WAP legacy protocol stack does not provide for end-to-end security? Limit your answer to 3 or 4 sentences. Feel free to make a drawing.

Question 3b (6 points): What does this mean for small content providers (say a startup with 5 or 6 employees) who want to authenticate users? Limit your answer to 2 or 3 sentences.

Question 3c (5 points): What is the security element introduced in WAP to support client authentication? (one sentence is enough)

Question 3d (4 points): Identify two ways in which this security element can be implemented. Explain how different implementations could impact the mobile commerce value chain and, in particular, the position occupied by mobile operators. Limit your answer to 3 or 4 sentences.

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**Question 4: OSA (10 points):**

Question 4a (5 points): Explain in no more than 5 or 6 sentences why architectures such as the Open Service Access (OSA) architecture developed by 3GPP are critical to the development of Mobile Commerce.

Question 4b(5 points): In no more than 4 or 5 sentences, explain how standards such as OSA could impact the business model of mobile operators. Give one example (1 or 2 sentences).

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**Question 5: WAP and i-Mode (25 points):**

In the Fall of 2000, the Nielsen Norman group conducted a usability study involving 20 users accessing mobile Internet services from WAP phones over GSM networks in the London area. The results of the study came as a real blow to WAP. A sample of the results from the study is provided in the table below, comparing the time it took users to access 4 different services (a) on the first day of the study and (b) after a week of daily usage.

	Day 0 (Mean number of minutes)	Day 7 (Mean number of minutes)
Read World Headlines – built-in portal	1.3	1.1
Retrieve Guardian Headlines	0.9	0.8
Check Local Weather Forecast	2.7	1.9
Read TV Listing Program	2.6	1.6

Question 5a (4 points): Identify 4 sources of frustration among early WAP users such as those studied by the Nielsen Norman Group (one sentence each).

1.

2.

3.

4.

Question 5b (4 points): Some people claim that the introduction of GPRS should take care of the problems identified in the Nielsen Norman study.

1. Give one reason why this view is partly correct (2 points) – limit your answer to 2-3 sentences:
2. Give one reason why this view is partly incorrect (2 points) – limit your answer to 2-3 sentences:

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Question 5c (8 points): By early 2001, i-Mode, which had been launched two years earlier (in February 1999), had already managed to attract 20 million users in Japan. Identify 4 aspects of i-Mode that made it more appealing to users than its counterpart WAP services in Europe. Limit your answer to one or 2 sentences per bullet.

1.

2.

3.

4.

Question 5 d (9 points): List 3 innovations introduced in WAP and WML to enhance usability. Limit your answers to 2 sentences per innovation.

1.

2.

3.

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**Question 6: Mobile IP (15 points):**

In no more than 10 lines, please outline how mobile IP works. You will not be penalized if you do not remember the exact terminology. Just make sure to outline the basic principles of mobile IP. If necessary, feel free to draw a diagram.

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**Feedback (optional):**

- If you feel that a question was unclear, please indicate below the number of the question and provide a brief explanation.
- Was preparation for this exam a good way to get you to go over the class material again? Would you have reviewed the material otherwise?
- Do you feel that this test was fair and properly complements the class presentation and project you are to deliver as part of this course? If not, what would you have done differently?
- How long did it take you to finish this exam?