



## FIRST SEMESTER EXAMINATIONS 2010/11

### MOBILE COMPUTING (Mock Paper)

**TIME ALLOWED : Two and a Half Hours**

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#### INSTRUCTIONS TO CANDIDATES

Attempt all FIVE questions in Section A.  
Attempt TWO of the three questions in Section B.  
*In this Mock paper we only have one question in B.*

If you attempt to answer more questions than the required number of questions (in any section), the marks awarded for the excess questions answered will be discarded (starting with your lowest mark).

## SECTION A

**Attempt all FIVE questions from this section. Section A is worth 50 marks.**

1. Explain why in most cases, HCI is so important in getting a device adopted from a Business perspective. Give a contrary example where a technology experienced high adoption after being introduced, despite poor HCI design, and explain why this was the case.

**(10 marks)**

2. Compare and contrast the delivery mechanisms used by SMS and MMS. Describe each, and give details about how MMS messages are sent to legacy (non MMS capable) devices.

**(10 marks)**

3. The Desktop and Mobile E-Commerce experience can differ wildly. Describe one limitation and one advantage of using a mobile device for e-commerce.

**(5 marks)**

Speculate on how RFID sensors could be used to transform a mobile device into a self-pay point-of-sales device? How could a store differentiate between legitimate purchases and shoplifted goods?

**(5 marks)**

4. Describe why spatial context can be relevant for mobile applications, and give three different examples of spatially-aware applications, explaining how the spatial context can be exploited by the application.

**(10 marks)**

5. Given the following three 8 chip spreading codes, calculate the bits sent by receivers A B and C with the combined transmitted chips (-1, -1, 3, 1, 1, -3, 1, 1). Ensure that in your answer, you include all the steps of your calculation.

- $A_k = 11001100$
- $B_k = 10101010$
- $C_k = 10010110$

**(6 marks)**

A new device,  $D$  starts transmitting data, with a spreading code  $D_k = 1001101$ . If  $A$  and  $D$  want to send a single data bit whose value is 0, whilst  $B$  and  $C$  send one-valued single data bits, what would be the value of the combined transmitted chips received by the UMTS B-Node?

**(4 marks)**

## SECTION B

**Attempt TWO questions from this section. Each question is worth 25 marks. Credit will be given for the best 2 answers only.**

**1.** Entering text into a mobile device has always been challenging, and a variety of solutions have been proposed.

(a) Why are physical keyboards undesirable on a mobile device, and yet still preferred over the use of handwriting and character recognition. In your answer, consider the demands that different solutions place on the design of the device itself, as well as how these factors are affected by the international market. Include a contrary example where character recognition may be preferable for some international markets, and justify your argument. **(15 marks)**

(b) The use of virtual keyboards has long been used as an alternative metaphor for entering text, yet until recently have mainly required the use of a stylus, thus limiting the type of touchscreen that could be used to resistance-based. Describe the challenges of using a virtual keyboard, and explain how techniques borrowed from SMS entry have facilitated the adoption of capacitance-based touchscreens. **(10 marks)**

**2.** *Two other questions will appear in the final exam paper*