Student Number:

The University of Melbourne

Semester 2 Final Examination 2016

Department of Computing and Information Systems
COMP90018 Mobile Computing Systems Programming

Reading Time 15 minutes.

Writing Time Two hours.

This paper has 8 pages including this cover page.

Identical Examination Papers: None.

Common Content Papers: None.

Authorised Materials:
None.

Instructions to Invigilators:
Students will write all of their answers on this examination paper. Students may not remove any part of the examination paper from the examination room.

Instructions to Students:
This paper counts for 60% of your final grade. All questions must be answered in the indicated answer boxes provided on the examination paper. Answer each of the following questions by writing a brief response or explanation (no essays please!). Only material written inside the boxes will be marked. If you need to make rough notes, or prepare draft answers, you may do so on the reverse of any page. If you need additional space for your answers, you may use the overflow section on the last page.

Paper to be held by Baillieu Library: Yes.

Examiner use only:

Q1	Q2	Q3	Q4	Q5	Q6

Question 1: Hardware and Technical Requirements (10 Marks)

- List and briefly discuss 5 important differences between wired and wireless communication channels. (5 Marks)

- What is a WPAN and what are its distinguishing characteristics? (5 Marks)

Question 2: User Interfaces (10 Marks)

- Explain the advantages and disadvantages between using a High Level UI and a Low Level UI. (5 Marks)

- Why are voice user interfaces useful in mobile computing? What are the challenges of voice user interfaces? (3 Marks)

- Explain what is meant by the term *skeuomorphism* with respect to mobile design patterns and give an example. (2 Marks)

Question 3: Localization and Location Privacy (10 Marks)

1. Explain *obfuscation*. What is it trying to achieve? How does it achieve this? What is the difference between accuracy and precision with respect to obfuscation? Give a simple example that demonstrates obfuscation. (5 marks)

2. What is negative information? Describe how negative information can be used to gain useful data without any given user having to reveal private information. Give an example. (5 marks)

Question 4: Ad-hoc Routing Protocols (10 Marks)

1. Discuss the Layered, Hierarchical and Flat architectures in wireless sensor networks. (3 Marks)

2. Describe the LEACH protocol. What is a scenario that can cause the hot spot problem? (7 Marks)

Question 5: Localization and Routing (10 Marks)

1. What is Flooding? What is Gossiping? What are the advantages and disadvantages of both in comparison to each other? (5 Marks)

2. Explain a range-based localisation method and a range-free localisation method that was discussed in class. (5 Marks)

Question 6: Wireless Networks & RFID (10 Marks)

1. Discuss and explain the Binary Tree singulation protocol. Why is the Binary Tree protocol more efficient than the ALOHA protocol for RFID tags? (6 Marks)

2. Discuss two applications of RFID and list one possible security concern that needs to be accounted for. (4 marks)

Overflow Answers

The boxes here are for emergency use only. If you do need to use this page, indicate **CLEARLY** in your previous answer that you have continued onto this page. In addition, **CLEARLY** indicate which question you are answering. Without such an indication, it is possible that this part of your answer will be overlooked.