Sample/practice exam 2014, questions

Mobile Computing Systems Programming (University of Melbourne)

Student Number:

The University of Melbourne

Semester 2 Sample Assessment 2014

Department of Computing and Information Systems
COMP90018 Mobile Computing Systems Programming

Reading Time 15 minutes.

Writing Time Three hours.

This paper has 10 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: No.

Examiner use only:

Q1	Q2	Q3	Q4	Q5	Q6	Q7

Question 1: Programming for Mobile Devices (X Marks)

- Discuss the two fundamental approaches presented in the lecture to develop software for mobile devices depending on the capabilities of a device.

- Assume that a wireless thin client has only a browser but no other software installed. Detail the necessary components to enable thin clients to access and store information via the Internet.

Question 2: User Interfaces (X Marks)

- Explain in what way a smartphone differs from a desktop PC with regard to user interfaces.

- What is the purpose of Attributes for Text Fields using Android? Give some examples and discuss their purpose.

- We discussed user interfaces for mobile devices in the lecture. Discuss a few techniques for good user interfaces and explain why they are useful for mobile devices.

Question 3: Mobile Games (X Marks)

1. In the class we divided mobile games into two categories. One category are input-driven games. What is the other category? Explain both categories and give game applications for each category.

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

1. Compare the two classes of topological routing protocols for ad-hoc routing in terms of mobility.

2. When is the flooding protocol preferred for mobile networks?

Question 5: Localization and Location Privacy (X Marks)

1. Explain and discuss a non-range based localisation method.

2. Discuss whether or not non-range based positioning techniques can be used for location-based services that safeguard location privacy using obfuscation.

Question 6: Wireless Networks & RFID (X Marks)

1. Compare Bluetooth to ZigBee. What do they have in common, how do they differ? Do not provide numerical details (for example, for their range and bandwidth). Instead, focus on a qualitative discussion. Furthermore, you do not need to mention applications.

2. Why does the ZigBee standard specifies a routing protocol whereas the Bluetooth standard does not specify one for piconets? Which protocol is part of the ZigBee standard?

3. Discuss and explain the ALOHA protocol. Why is the ALOHA protocol not an efficient singulation protocol for RFID tags? How can it be improved?

Question 7: Data Collection from a Network (X Marks)

1. When collecting data from a set of sensor to measure a phenomena, e.g., traffic flow, we may need to push all the data to a center. This could be an overwhelming task for a classical central database server. For this reason, data stream management systems or (DSMSs) could be used. List at least three key differences between a DSMS and a DBMS.

2. For some data collection tasks, e.g., finding max traffic flow in a region, in-network processing could be prefered. Among several approaches, a well-known approach is to create a routing tree to collect the data and accommodate in-network processing on this tree. State the main disadvantage of this approach and briefly discuss a key alternative to using a simple tree.

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.