THE UNIVERSITY OF
SYDNEY

MODEL EXAMINATION

Semester 2 - Main, 2020

COMP5216 Mobile Computing

For Examiner Use Only

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EXAM WRITING TIME: 3 hours

EXAM CONDITIONS:
This is a short release take-home exam.

INSTRUCTIONS TO STUDENTS:
Please answer ALL questions in the provided spaces on this exam paper answer booklet.

You can insert hand drawn diagrams as images into the relevant space of the word document or use drawing tools of MS Word for diagrams.

After answering ALL questions, convert this word document to a PDF and upload it to "Final Exam – Main" assignment at Canvas site "Final Exam for: COMP5216".

Please tick the box to confirm that your examination paper is complete. ☐

Question 1

1.1 List an advantage of using Network Location instead of GPS location and provide an example use case for the given advantage. **[4 marks]**

1.2 Many users have regular device charging patterns that can be easily captured with modern machine learning capabilities. If your app is able to predict the next charging time, explain **two** strategies that use this knowledge to reduce the energy consumption of your app. **[4 marks]**

Question 2

You have been asked to design an app that collects Motion Sensor and Body Sensor data from a smartphone and upload to a cloud service for fitness analytics. The app should start automatically across reboots or any user actions. Data is collected in a sample rate of few seconds. *Note: This is a design question only. You don't have to write code for this.*

2.1 Describe technical approach that you plan to follow including the basic components of Android you need to develop this app (You may use a block diagram to explain your design). **[6 marks]**

2.2 If the data upload process is not real time, describe two methods you can use to reduce resource usage (e.g. bandwidth and energy). **[4 marks]**

2.3 If the data upload requirement is real time describe, describe two methods you can use to reduce resource usage (e.g. bandwidth and energy) ? **[4 marks]**

Question 3

Design an Android mobile app that records the distance travelled by the user throughout the day and display it to the user whenever the user invokes the app with historical statistics. *Note: This is a design question only. You don't have to write code for this.*

3.1 Describe two methods of obtaining the distance travelled by the user and explain why one method will not be sufficient to record distance throughout the day. **[6 marks]**

3.2 Propose an energy efficient algorithm to collaboratively utilize the above two methods of distance calculation. (Note: Specify if you have made any assumptions on the default settings of the smartphone). **[6 marks]**

3.3 Name the android permissions required for the functionality of the app. **[2 marks]**

Question 4

You started a new company to sell small electronic items online. Smartphones can be used in numerous ways to enhance the efficiency of every business. Design an innovative mobile app to improve your productivity of your new

business. Note: Innovation, feasibility, and usability will be taken into account for marking.

4.1 Briefly explain the primary goal of your app. **[2 marks]**

4.2 Justify the innovation of your solution (competitive advantage) **[6 marks]**

4.3 Explain the functionality of your app (how your mobile app works) with storyboards or a block diagram. **[8 marks]**

4.4 Explain your technical approach in developing the above proposed app as an Android mobile app. **[8 marks]**

END OF EXAMINATION