University of Waterloo

ECE 655 Final Exam, Fall 2015

ECE 655 – Protocols, Software and Issues in Mobile Computing

Instructor: Prof. Sagar Naik

Date and time: December 11, 2015, 9:00 AM—11:30 AM

Room: E5--5106/28

Instructions

- You have 2.5 hours to complete the exam.
- This is a closed book exam.
- Should there be a need, make an assumption and proceed.

Question	Marks
Q1.	/10
Q2.	/10
Q3.	/10
Q4.	/10
Q5.	/10
Total	/50

Student ID **Student Name** **Student Signature**

1. **10 marks**

Match the two columns and find the largest number of best matched pairs.

	Column 1	Answer (A—M)		Column 2
1	FACCH		A	This channel carries LAI information
2	SACCH		B	Authentication of users
3	RACH		C	Simultaneously used in all the cells under the same MSC
4	PCH		D	Collision
5	AGCH		E	A mobile telephone number
6	BCCH		F	Borrows time slots from a TCH
7	SDCCH		G	Assigned when a user has not been granted a TCH
8	Guard space		H	Distinguishes network data from user data
9	IMSI		I	Carries signal power information to start handover
10	MSISDN		J	Carries a message to an MS to use a TCH or an SDCCH
11	Challenge/response		K	Uniquely identifies a mobile device
12	Low signal strength		L	Prevents overlap of transmissions from MS in the same cell
13	LAI		M	Invokes handover
14	Training bits			
15	TCH/F4.8			
16				

2. **10 marks**

In GSM networks, a full traffic channel gives a bit rate of 22.8 Kbps. Show the detailed calculations to produce the 22.8 Kbps rate.

3. **10 marks**

Clearly explain how location information is used in performing efficient routing in ad hoc networks.

4. **10 marks**

Clearly explain the mechanism that enables a mobile device to keep receiving data packets from a static server. Mobility of the user forces its device to be connected to different wireless networks.

5. **10 marks**

Clearly explain the impacts of *jitter* and *random access delay* (RAD) in the design of efficient broadcasting protocols by clearly explaining two specific protocols.

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