Beijing-Dublin International College

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SEMESTER I FINAL EXAMINATION - 2016/2017

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School of Electrical and Electronic Engineering

EEEN3008J Wireless Communications

HEAD OF SCHOOL: Dr. Andrew Kean
MODULE COORDINATOR: Dr. Hamed Ahmadi

Time Allowed: 120 minutes

Instructions for Candidates

BJUT Student ID: _____   **UCD Student ID:** _____

I have read and clearly understand the Examination Rules of both Beijing University of Technology and University College Dublin. I am aware of the Punishment for Violating the Rules of Beijing University of Technology and/or University College Dublin. I hereby promise to abide by the relevant rules and regulations by not giving or receiving any help during the exam. If caught violating the rules, I accept the punishment thereof.

Honesty Pledge： _____ **(Signature)**

Instructions for Invigilators
Non-programmable calculators are permitted.
No rough-work paper is to be provided for candidates.

Obtained score
15

Question 1:

   A. Name (or write center frequency of) three license free band.
   B. What are the motivations (use) of wireless LAN
   C. Draw the architecture of IEEE 802.11; write the name of its elements

Obtained score
20

Question 2:

   A. Compare piconets and scatternets
   B. Define software defined radio and cognitive radio, and compare them.
   C. Name a software radio platform
   D. Explain the concept of Carrier Aggregation
   E. Explain the meaning of the following equation

$$C = B \log_2 \left(1 + \frac{S}{I+N} \right)$$

Is it always beneficial to increase B? Motivate your answer.

Obtained score
15

Question 3:

   A. Which modulation techniques are used in LTE physical transmission
   B. Why LTE uses CQI, how many classes of CQI we have, and what is their difference?
   C. We have a CDMA system and three neighboring base stations. The base stations use the codes 111000, 000111, 110110 to transmit 1, respectively. Using the orthogonality of the codes discuss the interference in this system.