Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

Final Examination
Duration: 3 Hours
Course Code: PMIT - 6217

Semester: First Semester (Special Exam November 2018)
Full Marks: 60
Course Title: Wireless Network

Do not write anything on the question paper.
There are 7 **(Seven)** questions. Answer any 5 **(Five)** of them.
Figures in the right margin indicate marks.

1. a) Draw and describe the basic structure of a Mobile Cellular Network
   b) Explain Unlicensed Narrowband RF — 5
2. a) Explain the major Problems with Wireless network. — 7
   b) Explain Directional Antennas — 6
3. a) What is Frequency hopping? Why it is so useful? — 6
   b) "Avoid data frame collisions completely using small reservation packets!" Explain the statement. — 3
   c) Explain Infrastructure of Sensor Networks — 4
4. a) Draw the Flow Chart of CSMA/CD-Algorithm — 5
   b) Explain the mechanism of Hard Handover. — 8
5. a) What is Peak to Average Power Ratio (PAPR) and Cyclic Prefix — 4
   b) Draw and describe a baseband OFDM transmission model — 4
6. a) Handoff may be done based on two cases: — 8
   Case 1: mobile station sends the collected information to the BS
   Case 2: mobile station itself selects the most suitable BS.
   Explain these two cases.
   b) If a signal to interference ratio of 15 dB is required for satisfactory forward channel performance of a cellular system, What is frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is $\gamma=3$? Assume that there are six co-channel cells in the first tier and all of them are at the same distance from the mobile. — 4
7. a) Distinguish between Fixed Channel Allocation and Channel Borrowing Scheme — 6
   b) An urban area has a population of two million residents. Two computing trunked mobile networks (A and B) provide cellular service in this area. System A has 394 cells with 19 channels each, system B has 98 cells with 57 channels each. Find the number of users that can be supported at 2% blocking. If each user averages two calls per hour at an average call duration of three minutes. — 6