Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

II SEMESTER M.TECH. (COMPUTER NETWORKING AND ENGINEERING)

END SEMESTER EXAMINATIONS, APRIL 2017

SUBJECT: MOBILE COMPUTING [ICT 5201]

REVISED CREDIT SYSTEM
(20/04/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer ALL the questions.
- Missing data if any, may be suitably assumed.

1A. Explain the various types of encoding techniques that are used to convert a digital data to analog signal. Provide relevant equations to represent the signal waveform. Given an input signal 011010, show how modulation takes place in the case of ASK, FSK and PSK? (05)

1B. What are the different types of fading? What are the effects and reasons for fading? (03)

1C. What are the different types of antennas? What is the advantage of having antenna diversity? (02)

2A. Explain the working principle of Direct Sequence Spread Spectrum. Assume that there are two signals A and B with signal strength of A = (–1, +1, –1, –1, +1, +1) and that of B as (-1,-1, +1,-1, +1,-1). Show the effect on the output of the receivers for the two cases which are independent of each other. (05)

i) If the signal strength of B is 5 times that of A

ii) Add to the original signal a random noise of (–2, 0, 0,–2, +2, 0) after adding the two signals A and B.

2B. A total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (i) 4-cell reuse (ii) 7-cell reuse (iii) 12-cell reuse. (03)

2C. What are the services supported by GPRS? (02)

3A. With neat diagram, explain the architecture of GSM. (05)

3B. An urban area has a population of 2 million residents. Three competing trunked mobile networks (systems A, B, and C) provide cellular service in this area. System A has 394 cells with 19 channels each, system B has 98 cells with 57 channels each, and system C has 49 cells, each with 100 channels. Find the number of users that can be supported at 2% blocking if each user averages 2 calls per hour at an average call duration of 3 minutes. Assuming that all three trunked systems are operated at maximum capacity, compute the percentage market penetration of each cellular provider. Table Q.3B shows the total traffic carried for various channel size. (03)

Table Q.3B

Channels	Total Traffic Intensity
19	12
57	45
100	88

3C. How is the radio network different in the case of UMTS as against GSM? (02)

4A. Explain with neat diagram the different phases of HIPERLAN. (05)
4B. What are the four types of handover in GSM? (03)
4C. What is the role of Snooping in mobile TCP? (02)

5A. Assign suitable IP address to mobile host and show how is mobility supported in IP layer? Show the steps involved in the registration process when the mobile is using direct communication or through the foreign agent. Explain the agent advertisement and Agent solicitation process. (05)
5B. Elaborate on the master-slave, piconet, scatternet concepts of Bluetooth. (03)
5C. Explain the terms Memory Management Entity pool area and tracking area in the case of LTE network. (02)