Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VII SEMESTER B.TECH. (INFORMATION TECHNOLOGY)

MAKEUP EXAMINATIONS, NOV/DEC 2016

SUBJECT: MOBILE COMMUNICATIONS [ICT-401]

REVISED CREDIT SYSTEM
(26/12/2016)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** questions.
- Missing data may be suitable assumed.

1A. Consider an MFSK scheme with f_c = 250 KHz, f_d = 25 KHz, and M = 8.

i. Make a frequency assignment for each of the eight possible 3-bit data combinations.

ii. Apply FHSS to this using MFSK scheme with k = 2; that is, the system will hop among four different carrier frequencies. **(5)**

1B. Prove that for a hexagonal geometry, the co-channel reuse ratio $Q = \sqrt{3N}$, where $N=i^2+ij+j^2$. **(3)**

1C. A 12 bit hamming code whose hexadecimal value is E4F arrives at a receiver. What was the original value sent from the other end? **(2)**

2A Identify and explain the inefficiencies of mobile IP while forwarding the data from a Correspondent Node (CN) to a Mobile Node (MN). Also explain the optimization technique used to solve that inefficiency. **(5)**

2B. Identify and explain different categories of noise in a received signal. **(3)**

2C Assume that two antennas are half-wave dipole and each has a directive gain of 3dB. If the transmitter power is 1W and two antennas are separated by a distance of 10Km, what is the received power? Assume that the antennas are aligned so that the directive gain numbers are correct and frequency used is 100MHz. **(2)**

3A. With appropriate diagram, explain token based registration process followed in GSM **(5)**

3B. What are the original GSM network components do GPRS need? Explain the

additional components required to support GPRS **(3)**

3C. Distinguish between horizontally and vertically oriented space diversity antennas. **(2)**

4A. Consider a CDMA system where node A is having key=010011 and for B the key is 110101. Sender A wants to send the bit Ad=1. Sender B sends Bd=0. Find out the spreaded signal of A and B, signal received at the receiver by adding a noise of (-2,0,0,-2,+2,0). Find what can receiver can detect for sender A and B respectively? Discuss the effect of noise in CDMA. **(5)**

4B Explain the methods used to improve the cell coverage and cell capacity in cellular networks **(3)**

4C. How do IEEE 802.11, and Bluetooth, respectively, solve the hidden terminal problem? **(2)**

5A. Draw the classification of wireless MAC protocol and explain the following:

i.Resource Auction Multiple Access

ii.Zhangs Proposal

iii.Packet Reservation Multiple Access **(5)**

5B. List and briefly define different performance metrics that may be used to make the handoff decision. **(3)**

5C. What are the responsibilities of the MAC management sub layer in 802.11? **(2)**

6A. Write and explain the sequence diagram for handover procedure between intra MSC and inter BSC **(5)**

6B. A cellular service provider decides to use digital TDMA scheme which can tolerate signal-to interference ratio of 15dB in the worst case. Find the optimal value of N for

Omnidirectional antennas

a.1200 sectoring

b.600 sectoring

Should sectoring be used? If so which case should be? Assume path loss exponent 4. **(3)**

6C. What is Grade of service (GOS) in cellular network? How does it helps to allocate resources in cellular networks? **(2)**