Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institute of Manipal University

FIFTH SEMESTER B.TECH. (INFORMATION TECHNOLOGY/ COMPUTER AND COMMUNICATION ENGINEERING)

END SEMESTER EXAMINATIONS, NOVEMBER 2017

SUBJECT: PROGRAM ELECTIVE- I: MOBILE COMPUTING [ICT 4001]

(REVISED CREDIT SYSTEM)
(27/11/2017)

TIME: 3 HOURS MAX. MARKS: 50

Instructions to candidates:

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

1A. What is meant by analog and digital signaling of analog and digital data? Explain with suitable diagram. 05

1B. Distinguish between FDM and TDM. 03

1C. What is the channel capacity for a teleprinter channel with a 300 Hz bandwidth and a SNR of 3 dB? 02

2A. Explain UMTS architecture with a neat diagram. 05

2B. Assume that two antennas are half wave dipoles and each has a directive gain of 3 dB. If the transmitted power is 1W and the two antennas are separated by a distance of 10 km, what is the received power? Assume that antennas are aligned and the frequency used is 100 MHz. 03

2C. Distinguish between adjacent channel and co channel interferences. 02

3A. The coverage area of a cellular system is 2000 sq km with each cell having a radius of 5 square km, and there are a total of 1000 radio channels available for handling the traffic.
i. Find the system capacity for 7 cell reuse.
ii. If N= 4, how many times the cluster has to be replicated in order to approximately cover the entire cellular area? Calculate the system capacity for the given case. 05

3B. Assume a handoff is required at cell boundary and illustrate how the same is carried out with an illustration. 03

3C. What are different types of Bearer services? 02

4A. Explain the functional architecture of a GSM system with a neat diagram. 05

4B. Differentiate between classical Aloha multiple access and Slotted Aloha multiple schemes. 03

4C. What are the factors that determine antenna gain? 02

5A. Describe the functions of the SIM and MS. Why does GSM separate the MS and SIM?Briefly explain user authentication and key generation process in a SIM. 05

5B. What is the maximum distance between two antennas for LOS transmission if one antenna is 100 m high and other at ground level? Assume the receiving antenna is 10 m high and to achieve the same distance, what should be the height of the transmitting antenna? 03

5C. How does follow on services are different from location aware services? 02