Reg. No.											

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

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

END SEMESTER EXAMINATIONS, APRIL/MAY 2019

SUBJECT: MOBILE COMPUTING [ICT 5201]

REVISED CREDIT SYSTEM

(24/04/2019)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Explain with a suitable diagram, how data transfer take place in Mobile IP. Explain discovering, registering and tunnelling mechanisms of the same. **5**

1B. Explain the following, **3**

i) Short Message Mobile Terminated Point-to-Point

ii) Short Message Mobile Originated Point-to-Point

1C. Show the steps for a handover from one foreign agent to another foreign agent with a neat diagram. **2**

2A. Explain IEEE 802.11 protocol architecture with suitable illustrations. **5**

2B. A certain city has an area of 1,300 square miles and is covered by a cellular system using a 7-cell reuse pattern. Each cell has a radius of 4 miles and the city is allocated 40 MHz of spectrum with a full duplex channel bandwidth of 60 kHz. Assume a GOS of 2% for an Erlang B system is specified. **3**

If the offered traffic per user is 0.03 Erlangs, compute

i) the number of cells in the service area

ii) the number of channels per cell

iii) traffic intensity of each cell, (A=83.13)

iv) the maximum carried traffic

v) the total number of users that can be served for 2% GOS

vi) the number of mobiles per channel

vii) the theoretical maximum number of users that could be served at one time by the system.

2C. If 40 MHz of total spectrum is allocated for a duplex wireless cellular system and each simplex channel has 20 KHz RF bandwidth, find: **2**

i) The number of duplex channels

ii) The total number of channels per cell site, if N=3 cell reuse is used

3A. Differentiate between tunneling and encapsulation and explain how tunneling works in Mobile IP that uses IP-in-IP, minimal and generic routing encapsulation respectively? **5**

3B. Explain the UMTS architecture with a diagram. 3

3C. State the differences between soft handover and hard handover in cellular networks. 2

4A. Explain, how security will be ensured in GSM? 5

4B. Explain the working of EY-NPMA scheme with suitable illustrations. 3

4C. Suppose a transmitter produces 60 W of power. 2

i) Express the transmit power in units of dBm and dBW.

ii) If the transmitter's power is applied to a unity gain antenna with a 900-MHz carrier frequency, what is the received power in dBm at a free space distance of 100 m?

5A. Explain the following Ad-hoc Routing Protocols with diagrams. 5

i) Distance Vector

ii) DSDV

iii) DSR

5B. Explain the following channel assignment strategies. 3

i) Fixed channel assignment.

ii) Dynamic channel assignment.

5C. In case of reservation schemes how collisions are avoided during data transmission and why is the probability of collision lower compared to classical Aloha? What are the disadvantages of reservation schemes? 2