Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

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A Constituent Institution of Manipal University

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

END SEMESTER EXAMINATIONS, NOVEMBER 2017

SUBJECT: PROGRAM ELECTIVE VI : NEXT GENERATION TELECOM NETWORKS [ICT 4003]

REVISED CREDIT SYSTEM
(28/11/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Explain the UMAN discovery, registration and deregistration process using suitable diagram. 5

1B. Illustrate the significance of MME (Mobility Management Entity) pool areas, cell ID and GUTI (Global Unique Temporary ID) in LTE network. 3

1C. Consider the data given in Table Q.1C for downlink direction data transfer between Mobile Station and BTS. All other loss or gain parameters are 0 dB. Compute the distance that a MS can travel before soft handover takes place using relevant link budget equation and the graph shown in Fig. Q.1C.

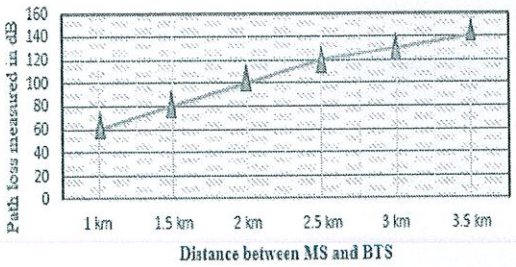

Fig. Q.1C: Path loss versus cell radius

Receiver Sensitivity	- 122 dBm
Required Signal Power	- 24 dBm
Cable loss	2 dB
BTS antenna gain	18 dBi
Interference Margin	2 dB
Soft Handover Gain	2 dB

Table Q.1C: Data for link budget computation

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2A. With a neat diagram, explain the detailed IMS architecture emphasizing the role of prominent functions involved in providing IMS access to UE. 5

2B. Illustrate using suitable diagram, the challenges involved in service evolution of Next Generation Technologies that is causing a pull to maintain legacy systems but is compromised by a push to generate revenue. 3

2C. Illustrate Hybrid Automatic Repeat request using suitable example. 2

3A. Describe cellular offloading feature and various modes of operation along with PLMN selection available for a Dual Mode Handset to initiate VoWiFi, when it is powered on. 5

3B. State the need of network planning in telecom networks and the steps involved in network planning of a UMTS network 3

3C. Enumerate the coexisting technologies in LTE to support the statement "LTE is a pool of technologies that offers converged services." 2

4A. List the changes incorporated in WCDMA network to realize a HSUPA network and explain the logical channels using user plane protocol diagram 5

4B. Enumerate the various next generation services in the context of triple play/quad play services. 3

4C. Compare and contrast the two methods of making voice call in LTE. 2

5A. With a neat diagram of protocol architecture of LTE, elucidate the significance of separating control plane from user plane protocols and the role QCI /ARP for enabling communication between UE and eNB. 5

5B. List the user benefits and attributes of femtocell. 3

5C. Describe the key aspects of IP Multimedia Subsystem. 2