USN ☐☐☐☐☐☐☐☐☐☐ **10EC81**

Eighth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Wireless Communication

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1   a.   Compare 1G and 2G cellular system.   **(04 Marks)**
    b.   Explain the different steps involved in AMPS-Mobile originated call.   **(08 Marks)**
    c.   With a neat diagram, explain the network elements of the SS7 system.   **(08 Marks)**

2   a.   With a block diagram, explain the MSC subsystem.   **(06 Marks)**
    b.   Explain the functions of HLR, VLR and MSC.   **(06 Marks)**
    c.   Explain with necessary diagrams the formats of MSISDN number, IMSI number, IMEI number and LAI number.   **(08 Marks)**

3   a.   Explain capacity expansion techniques,
      (i) Cell splitting   (ii) Cell sectoring   **(06 Marks)**
    b.   Explain the different power saving schemes.   **(06 Marks)**
    c.   For a particular radio transmission technology, a minimum S/I ratio of 15 dB is needed for proper operation. What is the minimum required cluster size? If the path loss exponent is $\alpha = 4$? Assume that there are six-co-channel cells in the first tier and all of them are at the same distance from the mobile.   **(05 Marks)**
    c.   Determine the frequency reuse distance for a cell radius of two kilometers and a cluster size of 4.   **(03 Marks)**

4   a.   Explain the various logical channels used in GSM.   **(10 Marks)**
    b.   Describe GSM protocols and signalling model with a neat diagram.   **(10 Marks)**

PART – B

5   a.   List out the ten operations in call setup in GSM system. Explain in detail authentication and ciphering mode operation.   **(12 Marks)**
    b.   Explain the intra-BSC-handover operation in GSM.   **(08 Marks)**

6   a.   Explain the basic spread spreading operation in CDMA.   **(06 Marks)**
    b.   Explain the different types of soft and hard handoffs supported by CDMA system.   **(06 Marks)**
    c.   Explain the generation of CDMA paging channels.   **(08 Marks)**

7   a.   Explain the path loss model for free space propagation.   **(06 Marks)**
    b.   With a neat block diagram, explain the RAKE receiver.   **(06 Marks)**
    c.   What is the received power in dBm for a signal in free space with a transmitting power of 50 W, frequency of 900 MHz and distance from the receiver of 100 meters if the transmitting antenna and receiving antennas have a gain of 1? What is P_r at 10 km?   **(08 Marks)**

8   a.   Explain with a neat figure the Bluetooth protocol stack.   **(08 Marks)**
    b.   Discuss the design issues of IEEE 802.11 and also provide the working of BSS, DS and ESS networks.   **(08 Marks)**
    c.   Describe the basic wireless MAN.   **(04 Marks)**

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