USN | | | | | | | | | | | **17EC81**

Eighth Semester B.E. Degree Examination, Feb./Mar. 2022
Wireless Cellular and LTE 4G Broadband

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain the advantages of OFDM for LTE. (08 Marks)
   b. Explain the following in brief:
      (i) Angular spread and coherence distance
      (ii) Nakagomi-m fading
      (iii) Doppler spread and coherence time. (12 Marks)

OR

2 a. Write the block diagram of Evolved packet core architecture and discuss the new elements of EPC. (08 Marks)
   b. Explain path loss Friis transmission formula. (04 Marks)
   c. With a neat diagram, explain adaptive modulation and coding. (08 Marks)

Module-2

3 a. With a neat block diagram, explain OFDM. (08 Marks)
   b. Compare OFDM-FDMA, OFDM-TDMA and OFDM-CDMA (06 Marks)
   c. Explain receive diversity selection combining and maximal ratio combining. (06 Marks)

OR

4 a. Write the block diagram of OFDMA downlink transmitter and explain the principle of operation. (08 Marks)
   b. Write a note on cyclic prefix in OFDM. (06 Marks)
   c. Compare OFDM system and SC-FDE system. (06 Marks)

Module-3

5 a. Explain the logical channels in LTE. (07 Marks)
   b. With necessary diagram, explain the frame structure type 1 for the FDD mode. (06 Marks)
   c. Explain the seven different transmission modes for the data transmission on the PDSCH channel. (07 Marks)

OR

6 a. Explain the synchronization signals in LTE. (10 Marks)
   b. Write the structure of downlink resource grid and explain the types of resource allocation. (10 Marks)

Module-4

7 a. With necessary block diagram, explain the SC-FDMA baseband signal generation. (10 Marks)
   b. Explain the types of uplink reference signals. (10 Marks)

OR

8 a. Explain the types of frequency hopping supported by LTE on PUSCH channel. (10 Marks)
   b. Explain the types of Random access procedures in LTE. (10 Marks)

Module-5

9 a. Explain the main services and functions of PDCP sublayer.   (10 Marks)

     b. Explain the data transfer model and the main services and functions of the RLC sublayer.

                                           (10 Marks)

OR

10 a. Explain RRC states and its functions.   (10 Marks)

      b. Explain the mobility management over X2 interface.   (10 Marks)

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