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15EC81

Eighth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Wireless Cellular and LTE 4G Broadband

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1 a. List the advantages of OFDM leading to its selection for LTE and explain. **(08 Marks)**
   b. Discuss the delay spread and coherence bandwidth with relevant expressions. **(08 Marks)**

OR

2 a. Write the block diagram of end to end architecture of EPC supporting current and legacy Radio access networks and discuss the elements of EPC. **(08 Marks)**
   b. Consider a user in downlink of a cellular system where the desired base station is at a distance 0.5 KM and the interfering base stations (i) B_1 and B_2 located at a distance of 1.0 KM, (ii) B3, B4 and B5 located at a distance of 2 KM (iii) B6 to B11 treated at a distance of 2.66 KM. Each of the stations transmitted power at the same level. Find the SIR when the path loss exponent $\alpha = 3$ and also when $\alpha = 5$. **(08 Marks)**

Module-2

3 a. With the help of neat diagrams explain how the timing and frequency synchronization is performed by the receiver to demodulate an OFDM signal. **(08 Marks)**
   b. Write the block diagrams of receive diversity and explain the principle of operation. **(08 Marks)**

OR

4 a. Write the block diagram of OFDMA down link transmitter and explain the principle of operation. **(08 Marks)**
   b. Explain the spatial multiplexing MIMD system and the key points of single user MIMD system model. **(08 Marks)**

Module-3

5 a. Discuss the radio interface protocol stock of LTE. **(08 Marks)**
   b. Write the structure of downlink resource grid and explain the types of resource allocation. **(08 Marks)**

OR

6 a. Write the Frame structure Type 2 and explain the various fields applicable to TDD mode. **(08 Marks)**
   b. Discuss the Broadcast channels and multicast channels. **(08 Marks)**

Module-4

7 a. With the help of a neat block diagram, explain the SC-FDMA base band signal generation. **(08 Marks)**
   b. Discuss the random access procedures in detail. **(08 Marks)**

OR

8 a. Explain the seven different transmission modes, defined for data transmission on the PDSCH channel. **(07 Marks)**

b. Discuss the scheduling and resource allocation in LTE. **(09 Marks)**

Module-5

9 a. Explain the main services and functions of the PDCP. **(08 Marks)**

b. Describe the various phases of S1 mobility with a neat diagram. **(08 Marks)**

OR

10 a. Explain the data transfer modes and the main services and functions of the RLC sublayer. **(08 Marks)**

b. Discuss the intercell interference coordination in downlink and uplink. **(08 Marks)**

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