



CBCS SCHEME

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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) B_3 , B_4 and B_5 located at a distance of 2 KM (iii) B_6 to B_{11} 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 MIMO system and the key points of single user MIMO system model. (08 Marks)

Module-3

- 5 a. Discuss the radio interface protocol stack 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)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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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