

# CBCS SCHEME

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17EC81

## Eighth Semester B.E. Degree Examination, Dec.2023/Jan.2024 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. List the advantages of OFDM leading to its selection for LTE and explain. (10 Marks)  
b. Discuss the delay spread and coherence bandwidth with relevant expressions. (10 Marks)

OR

- 2 a. Explain the following in brief:  
(i) Pathloss and Shadowing. (10 Marks)  
(ii) Angular Spread and Coherence distance. (10 Marks)  
b. Explain with a neat diagram adaptive modulation and coding. (10 Marks)

### Module-2

- 3 a. With a neat block diagram, explain OFDM communication system. Also mention the need of timing and frequency synchronization. (10 Marks)  
b. Explain SC-FDMA uplink transmitter with neat diagram. (10 Marks)

OR

- 4 a. Explain spatial diversity of multiple antenna techniques. (10 Marks)  
b. Explain open-loop MIMO in spatial multiplexing. (10 Marks)

### Module-3

- 5 a. Explain the LTE Radio interference protocols. (10 Marks)  
b. Explain the transport channels in LTE. (10 Marks)

OR

- 6 a. Explain the hierarchical channel structure of LTE. (10 Marks)  
b. Explain briefly layer mapping and precoding in modulation mapping. (10 Marks)

### Module-4

- 7 a. Explain uplink control information. (10 Marks)  
b. Explain the types of uplink reference signals. (10 Marks)

OR

- 8 a. Briefly explain the function of H-ARQ feedback in downlink and uplink transmission. (10 Marks)  
b. Explain in brief types of Random Access procedure in LTE. (10 Marks)

### Module-5

- 9 a. Explain the main services and functions of PDCP sublayer for the user plane. (10 Marks)  
b. Explain RRC states and its functions. (10 Marks)

OR

- 10 a. Explain mobility management over the SI transfer. (10 Marks)  
b. Explain three basic approaches to mitigate ICI in downlink. (10 Marks)

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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.