

CBCS SCHEME



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18TE81

Eighth Semester B.E. Degree Examination, July/August 2022 Advanced Cellular Communication

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain flat LTE SAE architecture. (08 Marks)
- b. Explain with a neat diagram, adaptive modulation and coding. (07 Marks)
- c. Consider a user in downlink of a cellular system where the desired base station is at a distance of 0.5km and the interfacing base stations :
 - i) B_1 and B_2 located at a distance of 1 km
 - ii) B_3 and B_4 located at a distance of 2 km
 - iii) B_6 to B_{11} treated at a distance of 2.66km. Each of the stations transmitted power at the same level. Find the SIR when the path loss exponent $\alpha = 3$ and also when $\alpha = 5$. (05 Marks)

OR

- 2 a. Explain the advantages of OFDM for LTE. (08 Marks)
- b. Discuss the delay spread and coherence bandwidth with relevant expressions. (06 Marks)
- c. Explain convolution and turbo codes. (06 Marks)

Module-2

- 3 a. Write the block diagram of OFDMA downlink transmitter and explain the principle of operation. (10 Marks)
- b. Explain OFDM in LTE with a neat diagram. (10 Marks)

OR

- 4 a. With a neat diagram, explain how the timing and frequency synchronization is performed by the receiver to demodulate an OFDM signal. (10 Marks)
- b. Compare V – BLAST and D – Blast uncoding techniques in detail with relevant diagrams. (10 Marks)

Module-3

- 5 a. Discuss in detail the broadcast and multicast channels. (06 Marks)
- b. Write the frame structure Type 2 and explain the various fields applicable to TDD mode. (08 Marks)
- c. Explain the hierarchical structural of LTE in terms of physical channels. (06 Marks)

OR

- 6 a. Discuss the radio interface protocol stack of LTE. (10 Marks)
- b. Explain in detail the principles of design used in LTE. (10 Marks)

Module-4

- 7 a. Explain with a mapping diagram the control unlinK information. (10 Marks)
- b. Explain briefly the function of H-ARQ feedback in Downlink and uplink transmission. (10 Marks)

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OR

- 8 a. Discuss the scheduling and resource allocation in LTE. (10 Marks)
b. Explain in brief the types of Random Access procedures in LTE. (10 Marks)

Module-5

- 9 a. Explain RRC states and its functions. (10 Marks)
b. Discuss the intercell interference co-ordination in downlink and uplink. (10 Marks)

OR

- 10 a. Explain the data transfer modes and the main services and functions of RLC sublayer. (10 Marks)
b. Explain the format of status of PDU and MAC. (10 Marks)
