

Eighth Semester B.E. Degree Examination, June/July 2025
Wireless and 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. If a transmitter produces 50 W of the power, express the transmitted power in units of i) dBm ii) dBW. If 50 W is applied to a unity gain antenna with 900 MHz carrier frequency, find the received power in dBm, at a free space distance of 100 m from antenna. What is P_r (10km)? Assume unity gain for the received antenna. (10 Marks)
- b. Derive expression for received power for two ray ground reflection model. (10 Marks)

OR

- 2 a. Explain the following:
 - i) Doppler spread and coherence time.
 - ii) Angular spread and coherence distance. (10 Marks)
- b. Explain the cellular concept briefly. Discuss how interference can be reduced in cellular communication. (10 Marks)

Module-2

- 3 a. Describe GSM protocols and signaling model with a neat diagram. (10 Marks)
- b. Explain various logical channels used in GSM. (10 Marks)

OR

- 4 a. Explain with a neat flow diagram:
 - i) Radio resource connection establishment
 - ii) Authentication. (10 Marks)
- b. Define Handoff. With a neat diagram, explain steps involved during Intra-BSC handover. (10 Marks)

Module-3

- 5 a. Explain network nodes found in CDMA2000 wireless system. (10 Marks)
- b. Explain the basic spectrum spreading operation in CDMA system with a neat diagram. (10 Marks)

OR

- 6 a. With a neat block diagram, explain generation of CDMA reverse access channel. (10 Marks)
- b. Explain different types of soft and hard handoffs supported by CDMA system. (10 Marks)

Module-4

- 7 a. Explain advantages of OFDM in LTE. (10 Marks)
- b. Explain flat LTE SAE architecture with neat diagram. (10 Marks)

OR

- 8 a. Explain OFDM system with neat block diagram. Also mention need of timing and frequency synchronization. (10 Marks)
- b. Describe significance of PAR problem in LTE. Explain PAR reduction technique. (10 Marks)

Module-5

- 9 a. Explain briefly different multiple access system which can be implemented with OFDM. (10 Marks)
- b. With a neat diagram, explain SC-FDMA. (10 Marks)

OR

- 10 a. Explain basic design principles followed in designing LTE specifications. (10 Marks)
- b. Explain different logical channels supported in LTE. (10 Marks)

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