



CBCS SCHEME

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18EC81

Eighth Semester B.E. Degree Examination, Dec.2024/Jan.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. Explain two ray ground reflection model and obtain the expression for E-field, path difference, phase difference and time delay. (10 Marks)
- b. If a transmitter produces 50 W of power, express the transmit power in units :
i) dBm ii) dBw. If 50 W is applied to a unity gain antenna with a 900 MHz carrier frequency, find the received power in dBm at a free space distance of 100 m from the antenna. What is P_r (10 km., Assume $G_r = 1$). (10 Marks)

OR

- 2 a. Explain cellular concept and sectoring to improve the capacity of the cell. (10 Marks)
- b. Explain :
i) Doppler spread and coherence time
ii) Delay spread and coherence bandwidth
iii) Angular spread and coherence distance. (10 Marks)

Module-2

- 3 a. Explain the various logical channel used in GSM. (10 Marks)
- b. With a neat diagram, explain GSM network and system architecture. (10 Marks)

OR

- 4 a. Define handoff and explain how call handoff is done in GSM technology. (10 Marks)
- b. List out the ten operations in call setup in GSM system. Explain in detail authentication and ciphering mode operation. (10 Marks)

Module-3

- 5 a. Explain CDMA spread spectrum operations in forward logic channels. (10 Marks)
- b. Explain the steps involved in call establishment in CDMA technology. (10 Marks)

OR

- 6 a. Explain the different types of soft and hard handoffs supported by CDMA system. (10 Marks)
- b. Explain the generation of reverse logical channels in CDMA technology. (10 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.

Module-4

- 7 a. Explain key enabling technologies and features of LTE system in detail. (10 Marks)
b. Explain with a neat diagram, how 3GPP network evolved towards flat LTE-SAE architecture. (10 Marks)

OR

- 8 a. With a neat block diagram, explain OFDM communication system. Also mention the need of timing and frequency synchronization. (10 Marks)
b. Discuss the significance of PAR problem in LTE. Briefly explain PAR reduction techniques. (10 Marks)

Module-5

- 9 a. Briefly explain the different multiple access system which can be implemented with FDMA. (10 Marks)
b. With a neat diagram, explain SC-FDMA. List out the advantages and disadvantages of SC-FDMA. (10 Marks)

OR

- 10 a. Explain the different logical, transport and physical channels supported in LTE. (10 Marks)
b. Explain Uplink SC-FDMA radio resources in LTE system. (10 Marks)
