

CBCS SCHEME



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18TE72

Seventh Semester B.E. Degree Examination, July/August 2022

Wireless Communications

Max. Marks: 100

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

Module-1

- 1 a. Derive the equation for received power using Free Space Propagation Model (FSPL). (08 Marks)
- b. If a transmitter produces 50 W of power, express the transmit power in units of dBm and dBW of 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 $P_r(10 \text{ km})$? Assume unity gain for the receiver antenna. (06 Marks)
- c. Describe Okumura model with the help of relevant equations and figures. (06 Marks)

OR

- 2 a. Explain Ground Reflection (Two-Ray) model with relevant figures and equations. (12 Marks)
- b. Discuss Fresnel zone geometry in diffraction. (08 Marks)

Module-2

- 3 a. Discuss small scale multipath measurements with the help of spread spectrum sliding correlator channel sounding system. (10 Marks)
- b. Explain co-channel interference and system capacity with relevant figure and equations. (10 Marks)

OR

- 4 a. Explain trunking and grade of service with the help of necessary equations and values. (10 Marks)
- b. Discuss the following concepts briefly:
 - (i) Direct RF pulse system.
 - (ii) Frequency domain channel sounding. (10 Marks)

Module-3

- 5 a. Explain the concept of Time Division multiple Access with relevant figures and equations. (10 Marks)
- b. Illustrate the capacity of cellular systems with necessary figures and equations. (10 Marks)

OR

- 6 a. Describe the following capacity improvement technique in detail –
 - (i) Cell splitting. (14 Marks)
 - (ii) Sectoring. (06 Marks)
- b. Discuss the Hybrid spread spectrum technique with relevant figure. (06 Marks)

Module-4

- 7 a. Discuss the different logical channels GSM uses to transmit large amounts of signaling information. (14 Marks)
- b. Describe the function of Base Station Subsystem (BSS) with necessary block diagram. (06 Marks)

OR

- 8 a. Explain the mapping of logical to physical channels in a GSM system with relevant figures. (10 Marks)
b. Discuss the technique of synchronization employed in GSM systems in detail. (10 Marks)

Module-5

- 9 a. Describe Long and Short spreading codes and Walsh codes used in IS-95 system. (08 Marks)
b. Explain the concept of coding employed in an IS-95 system. (12 Marks)

OR

- 10 a. Discuss the overview of IS - 95 system describing in detail the Air-Interface. (10 Marks)
b. Explain the logical and physical channels in an IS-95 system and the mapping of logical channel to physical channels. (10 Marks)
