Reg. No. : | E | N | G | G | T | R | E | E | . | C | O | M |

Question Paper Code : 90989

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Fifth Semester

Electronics and Communication Engineering

EC 3501 – WIRELESS COMMUNICATION

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the different types of Handoff techniques used in mobile networks?

2. What are the advantages of cell splitting in cellular mobile networks?

3. What is large scale fading? Mention its impact in the design of wireless environment?

4. What are the effects of reflection and scattering and the mobile multipath environment?

5. Write the properties of m-sequence to be pseudo random?

6. What is equalization? Write the need for it in wireless networks.

7. Compare FDMA and CDMA.

8. What are the strategies to improve the capacity in cellular wireless networks?

9. What is the role of Base station and mobile switching centre in cellular mobile network?

10. What is the multiple access technique used in 3G mobile network?

PART B — (5 × 13 = 65 marks)

11. (a) Explain the channel assignment strategies and hand off strategies utilized in cellular mobile systems.

Or

(b) Explain the significance of co-channel reuse ratio, signal to interference ratio and average received power. Illustrate the design for the 7 cell reuse pattern.

12. (a) (i) Write notes on the free space propagation model for large scale path loss measurement in wireless environment. (7)

(ii) Discuss the factors influencing small scale fading in the wireless environment. (6)

Or

(b) Write detailed notes on the slow fading, fast fading, frequency flat fading and frequency selective fading in mobile wireless environments.

13. (a) Explain the principle, working and applications of GMSK modulation technique in detail.

Or

(b) With a neat diagram, explain the Direct sequence spread spectrum system and discuss performance in the presence of a fading environment.

14. (a) (i) Explain the principle and frame structure of TDMA systems. (7)

(ii) Brief on SDMA and its benefits. (6)

Or

(b) Brief about the different hybrid spread spectrum techniques and its advantages.

15. (a) Compare and contrast the circuit switching and packet switching techniques with examples.

Or

(b) With necessary illustrations explain Universal Mobile Telecommunication System (UMTS).

PART C — (1 × 15 = 15 marks)

16. (a) (i) Generate a PN sequence with 4 shift registers and tapping at the output of Flip flop 1 and 4. Let the initial state of the registers be 1010. Verify the properties of PN sequence. (10)

(ii) With respect to the free space propagation model, discuss the significance transmission equation. (5)

Or

(b) Compare the development of wireless networks from 1G to 3G emphasizing the technical details and the respective technologies. (15)