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Question Paper Code : 81238

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 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. Highlight the significance of frequency reuse concept?
2. Give the correlation between interference and system capacity.
3. Give the free space path loss model expression.
4. What does the term Coherence bandwidth refers to?
5. List the properties to be satisfied by any generated PN sequence.
6. Why equalizers are critical?
7. List the various multiple access techniques used in second generation cellular systems.
8. What is the concept behind SDMA?
9. How would you rate the services of GPRS against GSM and EDGE from the end user perspective?
10. Differentiate between circuit and packet switching techniques?

PART B — (5 × 13 = 65 marks)

11. (a) In detail, present the different types handoff strategies with required diagrams and illustrations. Give examples for each.

Or

- (b) In any cellular system design, how is the improvement in coverage and capacity brought out dynamically?

12. (a) Give a detailed outline on factors and effects of various small scale multipath propagation in a wireless scenario.

Or

- (b) Elaborate on large scale path loss mechanisms. How does it differ from small scale fading.

13. (a) With a neat block diagram, explain the working of the spread spectrum modulation techniques (any two).

Or

- (b) (i) "MSK is the preferred choice of digital modulation technique over QPSK, BFSK in wireless scenario"- Give reasons to substantiate your answer. (9)

- (ii) Differentiate between frequency and time diversity concept. (4)

14. (a) Compare and contrast between FDMA, TDMA and CDMA. Present your views on their suitability in wireless applications.

Or

- (b) How is the capacity calculations performed for the cellular systems for single cell and for multiple cells? Highlight the impact of the access technique on system capacity.

15. (a) Give an overview on the evolution of various cellular standards. Give the functionalities and technical details of each standard.

Or

- (b) Highlight the difference between personal communication services/networks and the cellular architectures/services? Elaborate their working methodologies.

PART C — (1 × 15 = 15 marks)

16. (a) Derive the interference and system capacity derivations followed by analysis of cellular systems. Analyse the co-channel and adjacent channel interference and methods for controlling the same with relevant justification.

Or

- (b) It is required to perform equalization, diversity and channel coding to obtain diversity gain, coding gain and to neutralize channel effects for wireless applications? Justify this with illustrations.