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Question Paper Code : 81364

M.E./M.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Elective

Communication Systems

CU 9221/CP 951 – WIRELESS MOBILE COMMUNICATION

(Common to M.E. Computer and Communication, M.E. Communication and Networking, M.E. Digital Electronics and Communication Engineering, M.E. VLSI Design and Embedded Systems and M.Tech. Information and Communication Technology)

(Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the difference between channel equalization and channel estimation?
2. Define Co-channel reuse ratio.
3. What is the difference between QAM and QPSK schemes?
4. What is the need of equalization?
5. How is a pilot frequency used to correct signal fades within a diversity designed mobile-radio receiver?
6. What are the relative advantages of using feed-forward and feedback combining techniques?
7. How are the carriers assigned to OFDM input signal?
8. What are the MAC services of IEEE 802.11a that are not provided in the traditional LAN?
9. Write the requirement of selection of chip rate and message bit rate in spread spectrum technique.
10. Why is partial correlation important for Rake receiver rather than Full correlation?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Derive the relation between system capacity and co-channel interference. (8)
(ii) Discuss time and frequency coherence in the wireless channel. (8)

Or

- (b) (i) Discuss the effects to be considered for statistical channel model. (8)
(ii) Explain the processing stages for SAGE algorithm to calculate channel parameters. (8)
12. (a) (i) Discuss the factors influencing the small scale fading. (8)
(ii) Classify the small scale fading models based on multipath time delay Spread and Doppler Spread. (8)

Or

- (b) Explain the calculation of combined outage Average error probability. (16)
13. (a) (i) Explain the frequency diversity techniques and associated Smart receiving techniques. (8)
(ii) Explain the Equal-gain combining method. (8)

Or

- (b) Write notes on : (16)
(i) Maximal-Ratio combining.
(ii) Alamouti scheme of Diversity.
14. (a) Discuss Multicarrier modulation with overlapping sub channels. (16)

Or

- (b) Explain the Discrete Implementation of Multicarrier modulation. (16)
15. (a) (i) In a frequency hopping system, the switching speed of the synthesizer is $5\ \mu\text{s}$ and the message bit rate is 5 kbps after error-correcting coding. There are 5 hops per message bit and the final frequency multiplication is 8. What is the maximum processing gain obtainable? (8)
(ii) Explain Multiuser DSSS system. (8)

Or

- (b) Explain the RAKE receiver with a suitable block diagram. (16)