Reg. No. : | | | | | | | | | | |

Question Paper Code: 31586

B.E. / B.Tech. DEGREE EXAMINATION, NOVEMBER 2015

Fifth Semester

Information Technology

01UIT506 – WIRELESS COMMUNICATION

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Differentiate cellular telephony and cordless telephony.
2. Explain the significance of frequency reuse in cellular networks.
3. Express simplified path loss as a function of distance used for system design.
4. Find the far field distance for an antenna with maximum dimension of 1*m* and operating frequency of 900*MHz*.
5. List three important effects of small scale multipath propagation.
6. Define maximum excess delay of the power delay profile.
7. What are the applications of non linear equalizers?
8. Assume four branch diversity is used, where each branch receives an independent Rayleigh fading signal. If the average SNR is 20*dB*, determine the probability that the SNR will drop below 10*dB*. Compare this with the case of a single receiver without diversity.
9. Explain any three services by GSM.
10. Discuss the principle of OFDM modulation scheme.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain in detail about the various Hand Off strategies. (8)

(ii) If a signal-to-interference ratio of 15*dB* is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (i) *n=4* (ii) *n=3*. Assume that there are six co-channel cells in the first tier, and all of them are at the same distance from the mobile. Use suitable approximations. (8)

Or

(b) Discuss briefly about the various methods for improving average and capacity in cellular systems. (16)

12. (a) (i) Explain the free space path loss and derive the gain expression. (8)

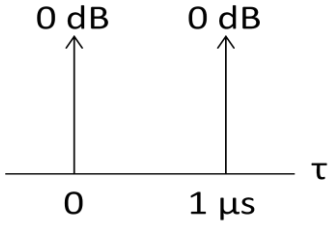
(ii) Describe in detail two ray model propagation mechanisms. (8)

Or

(b) Illustrate briefly about various empirical path loss models. (16)

13. (a) (i) Explain briefly with neat diagram about spread spectrum sliding correlator measurement of small scale fading. (8)

(ii) Compute the RMS delay spread for the following power delay profile.
(a) P(τ)



(b) If BPSK modulation is used, what is the maximum bit rate that can be sent through the channel without needing an equalizer? (8)

Or

(b) (i) Explain about the fading effects due to multipath time delay spread. (8)

(ii) Write short notes on Rayleigh and Ricean distributions. (8)

14. (a) Describe the need for algorithms in adaptive equalization. Compare ZF, LMS and RLS algorithms of adaptive equalization. (16)

Or

(b) (i) Express with a block diagram about maximal ratio combining. (8)

(ii) Explain in detail about linear equalizers. (8)

15. (a) (i) Illustrate the block diagram of IS-95 transmitter. (8)

(ii) Give a detailed description of OFDM transceiver. (8)

Or

(b) (i) Explain briefly about the classification of GSM logical channels. (8)

(ii) Describe call handling in AMPS and ITACS. (8)

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