

Registration Number :

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B.E. / B.Tech. (Part Time) DEGREE ARREAR EXAMINATION – APRIL/MAY 2014
ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH
FIFTH SEMESTER – (REGULATIONS R 2009)
PTEC9352 – WIRELESS COMMUNICATION

Duration : 3 Hours

Max. Marks = 100

Answer ALL the questions.

PART- A (10 x 2 = 20 marks)

1. Define Coherence time and highlight it's relationship with mobility.
2. What is the need for predicting and estimating the path loss during wireless link design.
3. Highlight the merits and demerits of Fixed channel assignment schemes.
4. List out the similarities and differences between Cordless systems and cellular systems.
5. What is the impact of the BT product on the BER of GMSK based transmission system.
6. Define Peak-to-Average Power Ratio with reference to OFDM signals.
7. Draw the structure of a 3-finger RAKE receiver.
8. What are the advantages of diversity techniques over equalization techniques.
9. What is the impact of inaccurate power control on CDMA systems.
10. What is the advantage of Adaptive Modulation and Coding used in Wi-Fi systems.

PART – B (5 x 16 = 80 marks)

11. Explain the impact of sectoring on the cellular system capacity and the trunking efficiency with suitable illustrations. A cellular service provider decides to use a digital TDMA scheme which can tolerate a signal-to-interference ratio of 15 dB in the worst case. What would be the best value for cluster size to support this worst case SIR for (i) Omni-directional antenna, (ii) 120° sectoring and (iii) 60° sectoring. Assume a path loss exponent of $n = 4$. Should sectoring be used, if so which case should be used.
- 12a. Explain the different mechanisms that cause path loss and fading in wireless mobile communication systems.

OR

12b. Explain the terms Coherence bandwidth, Coherence Time, RMS delay spread, Doppler spread, Level Crossing rate and Average Fade Duration for a mobile multipath channel. How does each of these parameters affect the application bandwidth and the communication system design for wireless channels.

13a. Draw and compare the signal constellation and allowable transitions for QPSK and Offset-QPSK schemes. Explain with suitable diagrams the transmitter and receiver implementation for both the schemes.

OR

13b. Explain the need for Cyclic Prefix extension in OFDM signaling scheme. With suitable block diagrams explain the different modules in the OFDM transceiver.

14a. Explain and compare the different diversity combining techniques used at the receiver for SNR improvement with suitable diagrams.

OR

14b. Draw the model for a 3 x 3 Multiple Input and Multiple Output wireless communication system and derive the corresponding mathematical model. Explain the impact of multiple antennas at the transmitter and the receiver on the BER performance and the capacity of the system.

15a. Draw and explain the block diagram of a Frequency Hopping Spread Spectrum system. Differentiate between Slow frequency hopping and fast frequency hopping with suitable illustrations and the relationships between chip duration, symbol duration and hop duration.↵

OR

15b. With suitable diagrams and explanation differentiate between the forward and the reverse link physical layer processing steps in IS-95 standard.
