EECS 562

Homework 14

1. What determine the length of the cyclic prefix?

2. How is carrier synchronization acheived in OFDM systems?

3. A multipath fading channel response approximately constant over 33.3μs? What is an appropriate subchannel spacing for an OFDM system.

4. LTE uses only FDMA, TRUE or FALSE

5. In LTE OFDM systems the symbol time is 12.8 μs sec. Why is the spacing between the subcarriers must be 78.125 kHz?

6. To deploy their LTE system a telecommunications company has leased 13.515 MHz of occupied bandwidth which supports 901 downlink subcarriers. Assume that every subcarrier uses 256-QAM. What is the downlink bit rate in Mb/s?

7. When an LTE operator uses a 20 MHz channel bandwidth in the downlink there are 1200 occupied subcarriers. In LTE the OFDM symbol time, T=1/15000 sec with a subcarrier separation of 15kHz.

a. If all 1200 subcarriers use 64-QAM what is the total bit rate of in Mb/s.

b. If all 1200 subcarriers use 256-QAM what is the total bit rate of in Mb/s.

8. What is CSI?

9. What is AMC?

10. All the OFDM symbols in an RB are is assigned the same modulation format. Each RB has 12 subcarrier with 7/symbols/subcarrier. Calculate the bit rate in (kb/s) for an RB with the following modulation assignments,

a. QPSK

b. 16-QAM

c. 256-QAM

11. How many RBs are available with a 10MHz channel assignment.