EECS 562
Homework #8

1. You are guaranteed that a signal using Manchester (split-phase) line coding has no DC component. True or False.

2. You are guaranteed that a signal using Non-return to-zero (NRZ) line coding has no DC component. True or False.

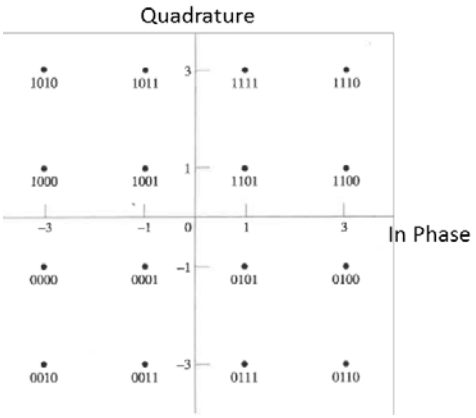
3. 7.11

4. 7.13

5. 7.14 but use a carrier frequency of 5 MHz.

6. Explain the operation of the QPSK coherent detector in Figure 7.7 page 276. Relate the LPF followed by a sampler in figure 7.7 to an integrate and dump in the in-phase and quadrature channels respectively – see figure 10.8 pp 409.

7. A signal space diagram (constellation) is given below:



a) For this constellation what is M in M-QAM?
b) If the T_s = symbol time = 4 ms what is the bit rate?
c) What is the minimum transmission bandwidth?
d) For detection what integration time is used in figure 10.8 pp 409?
e) What is the RF signal for the symbol 0010?
f) In figure 10.8 pp 409 at the end of an integration time the I channel sample is 2.6 and Q channel sample is 1.9 what are the output bits?

8. Using http://demonstrations.wolfram.com/DigitalModulationQuadraturePhaseShiftKeyingQPSKSignalConstel/ Explain the impact in terms of the eye diagram, transmission bandwidth, and signal quality of the following parameter changes:

    a. Changing the raised cosine roll-off factor from .1 to 0.9.

    b. Changing the I/Q phase error from 0 to 25°.

    c. Explain what happened when you click on the trajectory.

9. Rank order the Eye Diagrams from best to worst. Do you think the impairment is from imperfect filter shape or jitter?