

ECE6606

Homework 7

- 1) Do the following problems from Chapter 11 in textbook: 2,3,7,10,11,12
- 2) Do the following problems from Chapter 12 in textbook: 1,2,3
- 3) Using the convolutional code from problem 1 decode the following sequence (assume encoder is flushed)

$$r = 11\ 11\ 10\ 10\ 01\ 01$$

- 4) Using the convolutional code in problem 1 decode the following sequence

$$r = .98\ 1.01\ .5\ .75\ 1.5\ -.2\ 1.5\ -.2\ .2\ 1\ 0.0\ 1.0\ 0.0\ 1.0$$

- 5) For the systematic rate 1/2 conv. code with $\underline{g}^{(0)} = 1$ and $\underline{g}^{(1)} = 1\ 1$ find the state diagram, show 3 stages of the decoding trellis and compute d_{free} .

- 6) Consider the (5,2) linear block code with generator matrix

$$G = \begin{matrix} 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 1 & 0 & 1 \end{matrix}$$

- a) Find the trellis representation for this code
- b) Decode $r = (0\ 1\ 1\ 1\ 1)$ on the trellis using the Viterbi algorithm
- c) Decode $r = (0.5, 1.1, 0.0\ 1.3\ 1.0)$ on the trellis using the Viterbi algorithm