

EECS 270

Homework #6

1. Given the following 12-bit code with three valid code words:

010000101010
101010000001
000101010100

- a) What is the Hamming Distance of this error detection and correction code? **(1.5)**
- b) The above error code is used on a communication channel where the maximum number of bits that can flip is 5. How many bits can be corrected with this code when used for this channel while still detecting all possible errors? **(1.5)**
- c) Given the two received codes below, can they be corrected? If so, what was the transmitted code? If not, what is the set of possible transmitted codes? **(2)**

101110000011
000100001100

2. Implement the following functions using only 2-to-4 or 3-to-8 decoders, inverters, and OR gates. **(5)**

$$F = \sum_{x,y,z}(2, 4, 7)$$

$$F = \prod_{w,x,y,z}(2, 3, 5, 13, 15)$$

3. Implement the above functions using only 2-input muxes (i.e. two data inputs and one select input), and inverters. Use as few muxes as possible. **(5)**