

EE 6082 HW 4

11.2 a) $\bar{g}^{(0)} = 110 \quad \bar{g}^{(1)} = 101 \quad \bar{g}^{(2)} = 111$

b) $G(D) = [1+D \quad 1+D^2 \quad 1+D+D^2]$

c) $Y(D) = [1+D^3+D^4+D^5 \quad 1+D+D^3+D^6 \quad 1+D^2+D^5+D^6]$

$\Rightarrow \bar{y} = (111, 010, 001, 110, 100, 101, 011)$

11.3

a) $g_0^{(0)} = 0101 \quad g_0^{(1)} = 1011 \quad g_0^{(2)} = 1110$

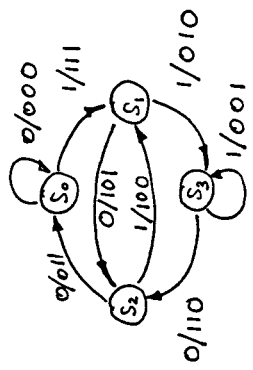
$g_1^{(0)} = 0110 \quad g_1^{(1)} = 1011 \quad g_1^{(2)} = 0100$

b) $G(D) = \begin{bmatrix} D+D^3 & 1+D^2+D^3 & 1+D+D^2 \\ D+D^3 & 1+D^3+D^3 & D \\ 1+D & 1+D^2 & \end{bmatrix}$

c) $X(D) = [1+D \quad 1+D^2]$

$Y(D) = X(D)G(D) = [0 \quad D+D^3+D^3+D^5 \quad 1+D]$

$\& \bar{y} = (001, 011, 010, 010, 000, 000, 010)$



11.7

11.10

$\text{gcd}(1+D+D^2, 1+D^3) = 1+D+D^2 \neq D^2$

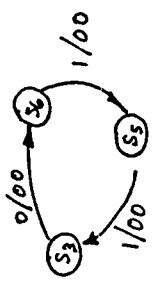
\therefore Catastrophic

11.11

a) $G^{(0)}(D) = D(1+D+D^2) ; G^{(1)}(D) = 1+D^3 = (1+D)(1+D+D^2)$

$\text{gcd}(D \neq D^2) \Rightarrow$ catastrophic.

b)



$\bar{X} = (011011011\dots)$ is a finite weight codeword.

11.12

No. All infinite-weight inputs are reproduced in systematic form at the output, \therefore output will also be infinite weight.