

Homework III**Due: February 3, 2009**

1. Find the greatest common divisor of each of the following pairs of polynomials.
 - (a) $f(x) = 1 + x + x^5 + x^6 + x^7$, $g(x) = 1 + x + x^3 + x^5$.
 - (b) $f(x) = 1 + x + x^2 + x^3 + x^4$, $g(x) = x + x^3 + x^4$.
2. First draw the diagram for the shift registers corresponding to generator polynomials $g(x)$, then compute $a(x)g(x)$:
 - (a) $g(x) = 1 + x + x^3$, $a = 1011$.
 - (b) $g(x) = x + x^2 + x^3 + x^4$, $a = 10110$.
3. Let $n = 9$ and $v = 1001100100$, then find a generator matrix of the smallest cyclic code C containing v .
4. Find all the proper cyclic codes of \mathbb{K}^{11} .