

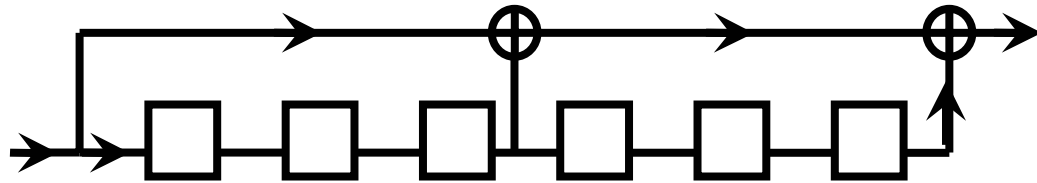
CMSC 652
Spring 2006
Answers to Homework 4

- 1) The polynomial $p(x) = x^2 + x + 2$ is primitive (hence, irreducible) over $GF(3)$. Use $p(x)$ to construct a log/antilog table for $GF(3^2)$.

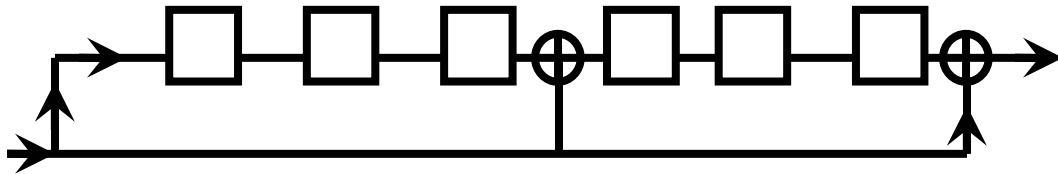
Log	AntiLog $a_1 a_0$
$-\infty$	00
0	01
1	10
2	21
3	22
4	02
5	20
6	12
7	11

- 2) (a) Draw the linear sequential circuit (LSC) that multiplies by the polynomial $h(x) = 1 + x^3 + x^6$

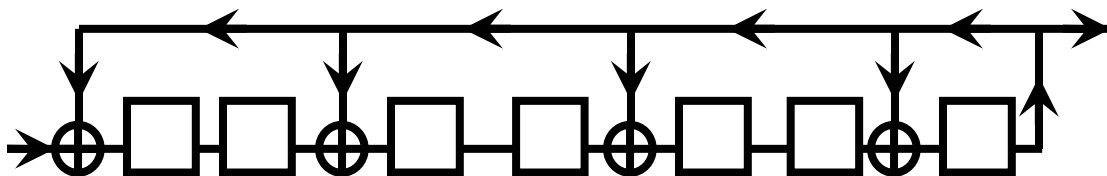
Answer:



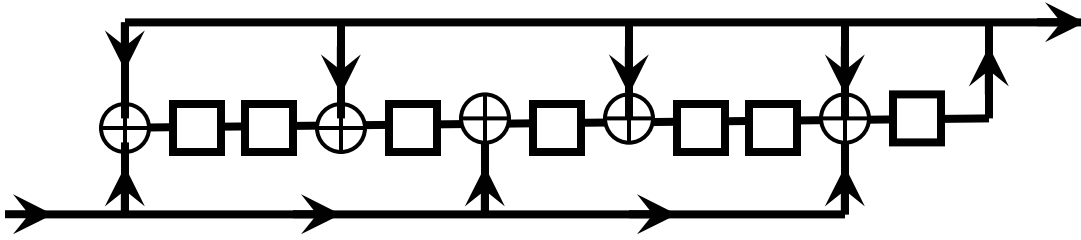
or



- (b) Draw the linear sequential circuit (LSC) that divides by the polynomial $g(x) = 1 + x^2 + x^4 + x^6 + x^7$



(c) Draw the linear sequential circuit (LSC) that simultaneously multiplies by $h(x)$ and divides by $g(x)$.



3) Draw an LSC which takes as inputs polynomials $a(x)$ and $b(x)$, and then produces the output $h(x)a(x) + k(x)b(x)$, where $h(x)$ and $k(x)$ are the polynomials:

$$h(x) = 1 + x^4 + x^{10} \text{ and } k(x) = x + x^2 + x^4 + x^7 + x^9$$

