$$A = q_3 q_2 \bar{q_1} \bar{q_0} + q_2 q_1 q_0 + q_3 q_1 q_0$$

$$B = q_3 q_2 \bar{q_0} + q_3 q_2 q_1 + \bar{q_3} q_1 q_0$$

$$C = \bar{q_1} q_0 + q_2 q_0 + q_3 q_0 + \bar{q_3} q_2 q_1 + q_3 \bar{q_2} q_1$$

$$D = \bar{q_1} + (q_2 \oplus q_0)(\bar{q_3} q_1) + q_3 q_2 q_1 \bar{q_0}$$

q_3	q_2	q_1	q_0	Dec	A	B	C	D	q_3^+	q_2^+	q_1^+	q_0^+	Dec
0	0	0	0	0					0	0	0	1	1
0	0	0	1	1				1	0	0	1	0	2
0	0	1	0	2				1	0	0	1	1	3
0	0	1	1	3		1			0	1	1	1	7
0	1	0	0	4				1	0	1	0	1	5
0	1	0	1	5			1	1	0	1	1	0	6
0	1	1	0	6			1		0	1	0	0	4
0	1	1	1	7	1	1	1	1	1	0	0	0	8
1	0	0	0	8				1	1	0	0	1	9
1	0	0	1	9			1	1	1	0	1	0	10
1	0	1	0	10					1	0	0	0	8
1	0	1	1	11	1			1	0	0	0	1	1
1	1	0	0	12	1	1		1	0	0	0	1	1
1	1	0	1	13			1		1	1	1	0	14
1	1	1	0	14		1		1	1	0	1	1	11
1	1	1	1	15	1	1	1		0	0	0	1	1

0 1 1 1
0 0 1 0

q3	q2	q1	q0	Dec	A	B	C	D	q3+	q2+	q1+	q0+	Dec
0	0	0	0	0	0	0	0	1	0	0	0	1	1
0	0	0	1	1	0	0	1	1	0	0	1	0	2
0	0	1	0	2	0	0	0	1	0	0	1	1	3
0	0	1	1	3	0	1	0	0	0	1	1	1	7
0	1	0	0	4	0	0	0	1	0	1	0	1	5
0	1	0	1	5	0	0	1	1	0	1	1	0	6
0	1	1	0	6	0	0	1	0	0	1	0	0	4
0	1	1	1	7	1	1	1	1	1	0	0	0	8
1	0	0	0	8	0	0	0	1	1	0	0	1	9
1	0	0	1	9	0	0	1	1	1	0	1	0	10
1	0	1	0	10	0	0	1	0	1	0	0	0	8
1	0	1	1	11	1	0	1	0	0	0	0	1	1
1	1	0	0	12	1	1	0	1	0	0	0	1	1
1	1	0	1	13	0	0	1	1	1	1	1	0	14
1	1	1	0	14	0	1	0	1	1	0	1	1	11
1	1	1	1	15	1	1	1	0	0	0	0	1	1

State diagram:
0 → 1 → 2 → 3 → 7 → 8 → 9 → 10 → (back to 8)
11 → 1, 12 → 1, 15 → 1
14 → 11, 13 → ...

4 → 5 → 6 → 4