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S	Initial state				Final State				Input Given			
	Q_4	Q_3	Q_2	Q_1	$\bar{Q_4}$	$\bar{Q_3}$	$\bar{Q_2}$	$\bar{Q_1}$	q_1	q_2	q_3	q_4
0	0	0	0	0	0	0	0	1	1	0	0	0
0	0	0	0	1	0	0	1	0	1	1	0	0
0	0	0	1	0	0	0	1	1	1	0	0	0
0	0	0	1	1	0	1	0	0	1	1	1	0
0	0	0	1	0	0	1	0	1	1	0	0	0
0	0	1	0	1	0	1	1	0	1	1	0	0
0	0	1	1	0	0	1	1	1	1	0	0	0
0	0	1	1	1	1	0	0	0	1	1	1	1
0	1	0	0	0	1	0	0	1	1	0	0	0
0	1	0	0	1	0	0	0	0	1	0	0	1
1	0	0	0	0	0	1	0	0	1	0	0	1
1	0	0	0	1	0	0	0	0	1	0	0	0
1	0	0	1	0	0	0	0	1	1	0	0	0
1	0	0	1	1	0	0	1	0	1	0	0	0
1	0	1	0	0	0	0	1	1	1	0	1	0
1	0	1	0	1	0	1	0	0	1	0	0	0
1	0	1	1	0	0	1	0	1	1	0	0	0
1	0	1	1	1	0	1	1	0	1	0	0	0
1	1	0	0	0	0	1	1	1	1	1	1	1
1	1	0	0	1	1	0	0	0	1	0	0	0

K maps

For S = 0;

q_2	$\bar{Q_2}\bar{Q_1}$	$\bar{Q_2}Q_1$	Q_2Q_1	$Q_2\bar{Q_1}$
$\bar{Q_4}\bar{Q_3}$	0 (0)	1 (1)	1 (3)	0 (2)
$\bar{Q_4}Q_3$	0 (4)	1 (5)	1 (7)	0 (6)
Q_4Q_3	d (12)	d (13)	d (15)	d (14)
$Q_4\bar{Q_3}$	0 (8)	0 (9)	d (11)	d (10)

JK for $q_2 = Q_1 \bar{Q_4}$

For S = 1,

q_2	$\bar{Q_2}\bar{Q_1}$	$\bar{Q_2}Q_1$	Q_2Q_1	$Q_2\bar{Q_1}$
$\bar{Q_4}\bar{Q_3}$	0 (0)	0 (1)	0 (3)	1 (2)
$\bar{Q_4}Q_3$	1 (4)	0 (5)	0 (7)	1 (6)
Q_4Q_3	d (12)	d (13)	d (15)	d (14)
$Q_4\bar{Q_3}$	1 (8)	0 (9)	d (11)	d (10)

JK for $q_2 = \bar{Q_1}Q_2 + \bar{Q_1}Q_3$
$+ \bar{Q_1}Q_4$

For S=0

q_3	$\bar{q_2}\bar{q_1}$	$\bar{q_2}q_1$	q_2q_1	$q_2\bar{q_1}$
$\bar{q_4}\bar{q_3}$	0 ₀	0 ₁	1 ₃	2
$\bar{q_4}q_3$	0 ₄	0 ₅	1 ₇	0 ₈
$q_4 q_3$	d ₁₂	d ₁₃	d ₁₅	d ₁₄
$q_4 \bar{q_3}$	0 ₈	0 ₉	d ₁₁	d ₁₀

Jk for $q_3 = q_1 q_2$

For S=1

q_3	$\bar{q_2}\bar{q_1}$	$\bar{q_2}q_1$	q_2q_1	$q_2\bar{q_1}$
$\bar{q_4}\bar{q_3}$	0 ₀	1	0 ₃	0 ₂
$\bar{q_4}q_3$	1 ₄	0 ₅	0 ₇	0 ₆
$q_4 q_3$	d ₁₂	d ₁₃	d ₁₅	d ₁₄
$q_4 \bar{q_3}$	1 ₈	0 ₉	d ₁₁	d ₁₀

Jk for $q_3 = \bar{q_1}\,\bar{q_2}\,q_3 + \bar{q_1}\bar{q_2}q_4$

q_4	$\bar{q_2}\bar{q_1}$	$\bar{q_2}q_1$	q_2q_1	$q_2\bar{q_1}$
$\bar{q_4}\bar{q_3}$	0	0	0	0
$\bar{q_4}q_3$	0	0	1	0
$q_4 q_3$	d	d	d	d
$q_4\bar{q_3}$	0	1	d	d

Jk for $q_4 = q_1 q_2 Q_3 + q_1 Q_4$

q_4	$\bar{q_2}\bar{q_1}$	$\bar{q_2}q_1$	q_2q_1	$q_2\bar{q_1}$
$\bar{q_4}\bar{q_3}$	1	0	0	0
$\bar{q_4}q_3$	0	0	0	0
$q_4 q_3$	d	d	d	d
$q_4\bar{q_3}$	1	0	d	d

Jk for $q_4 = \bar{Q_1}\,\bar{Q_2}\,\bar{Q_3}$