1.

Present State $Q1_n Q2_n$	Next State $Q1_{n+1} Q2_{n+1}$		Flip-Flop Inputs				Output, $Z_1 Z_2$	
	$x=0$	$x=1$	$x=0$		$x=1$		$x=0$	$x=1$
			$D1_n$	$D2_n$	$D1_n$	$D2_n$		
00	00	10	0	0	1	0	11	01
01	11	01	1	1	0	1	00	11
11	11	10	1	1	1	0	01	10
10	01	11	0	1	1	1	10	01

$D1_n$:

$$D1_n = Q2_n' x + Q1_n Q2_n + Q2_n x'$$

$D2_n$:

$$D2_n = Q1_n Q2_n' + Q1_n' Q2_n + Q2_n x'$$

Z_1:

$$Z_1 = Q2_n' x' + Q2_n x$$

Z_2:

$$Z_2 = Q1_n' Q2_n' + Q1_n' x + Q2_n' x + Q1_n Q2_n x$$

Logic Diagram