

ITI1100Z

Professor Qi Hao

Assignment # 6

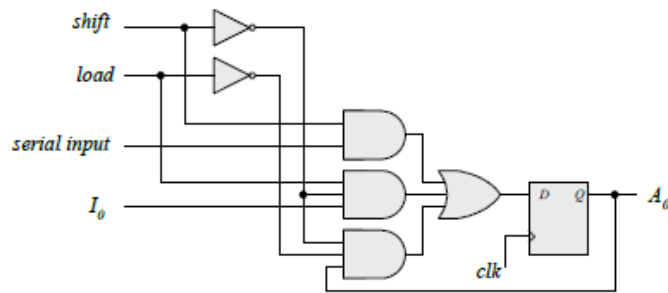
Submission Deadline July 21, 2018 midnight (11h59 PM), Brightspace

From the textbook Chapter five pages 368 to 371 in the 6th edition, solve the following problems:

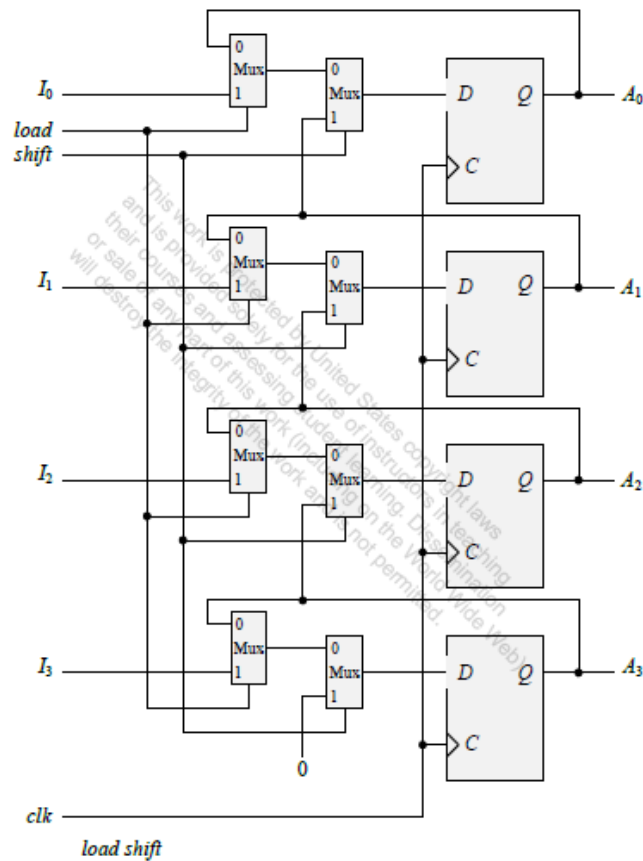
6.6, 6.11, 6.13, 6.24, 6.27

6.6 First stage of register:

Total
8 points



Implementation with muxes:



0	0	No change
0	1	Shift right (Towards LSB)
1	0	Parallel load
1	1	Shift right

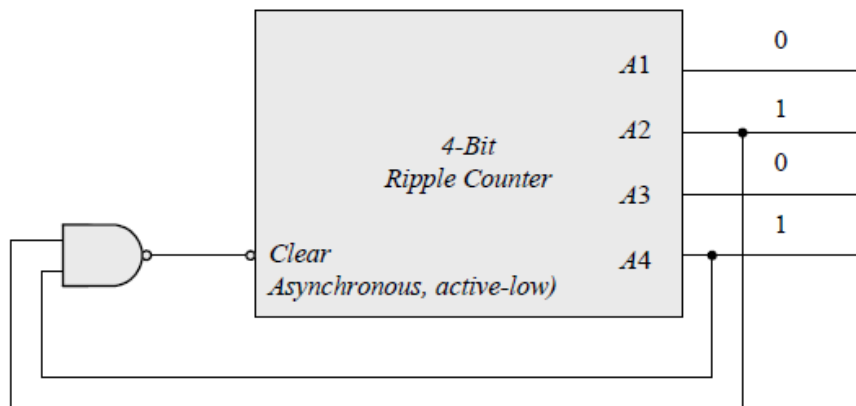
6.11 (a) A count down counter. 2 points

Total
4 points

(b) A count up counter. 2 points

6.13

Total
4 points



6.24

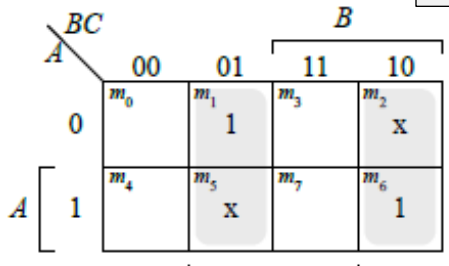
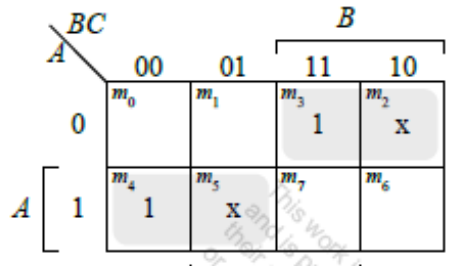
Total
12 points

Present state <i>ABC</i>	Next state <i>ABC</i>	Flip-flop inputs		
		T_A	T_B	T_C
000	001	0	0	1
001	011	0	1	0
010	xxx	x	x	x
011	111	1	1	0
100	000	1	1	0
101	xxx	x	x	x
110	100	0	1	0
111	110	0	0	1

2 points

2 points

2 points

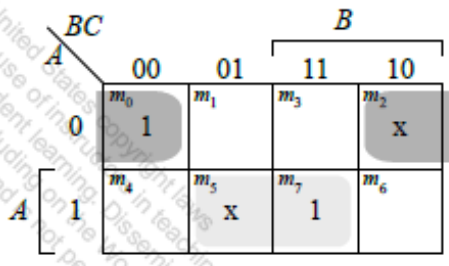
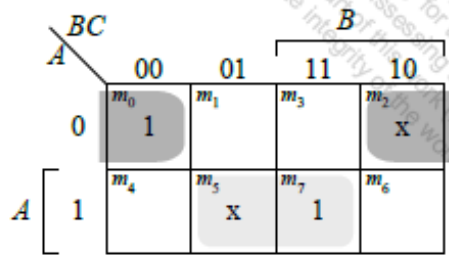


2 points

$$T_A = A \oplus B$$

$$T_B = B \oplus C$$

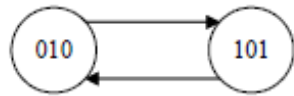
2 points



2 points

$$T_C = A \oplus C$$

$$T_C = AC + A'B'C'$$



No self-correcting



Self-correcting

6.27 (a)

Total
12 points

Present State	Next State	JK FF Inputs						
		ABC	ABC	J_A	K_A	J_B	K_B	J_C
000	001	0	x	0	x	1	x	
001	010	0	x	1	x	x	1	
010	011	0	x	x	0	1	x	
011	100	1	x	x	1	x	1	
100	101	x	0	0	x	1	x	
101	110	x	0	1	x	x	1	
110	000	x	1	x	1	0	x	
111	x x x	x	x	x	x	x	x	

2 points

FF A

$J_A = BC$					$K_A = B$				
A \ BC	00	01	11	10	A \ BC	00	01	11	10
0	m_0	m_1	m_3 1	m_2	0	m_0 x	m_1 x	m_3 x	m_2 x
1	m_4 x	m_5 x	m_7 x	m_6 x	1	m_4	m_5	m_7 x	m_6 1

2 points

FF B

$J_B = C$					$K_B = A + C$				
A \ BC	00	01	11	10	A \ BC	00	01	11	10
0	m_0	m_1 1	m_3 x	m_2 x	0	m_0 x	m_1 x	m_3 1	m_2
1	m_4	m_5 1	m_7 x	m_6 x	1	m_4 x	m_5 x	m_7 x	m_6 1

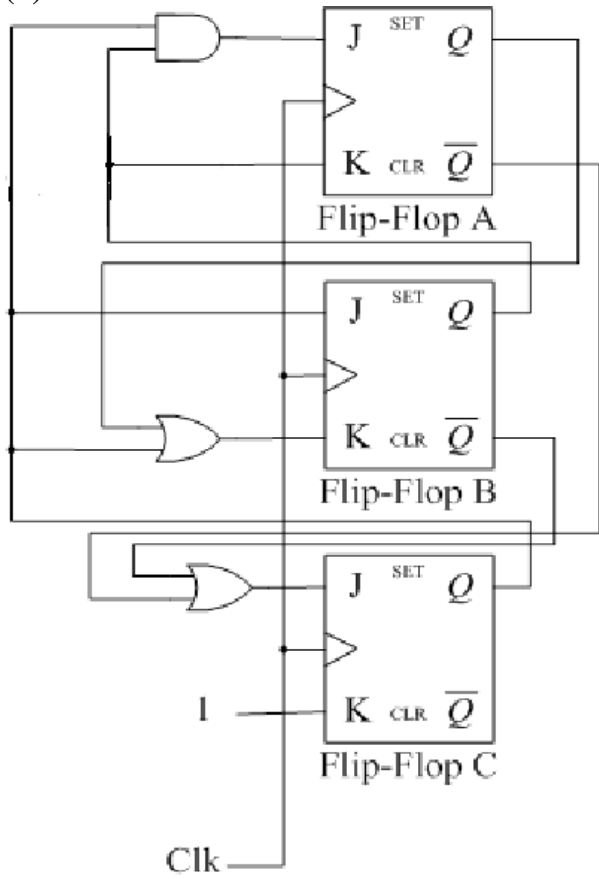
2 points

FF C

$J_C = A' + B'$					$K_C = 1$				
A \ BC	00	01	11	10	A \ BC	00	01	11	10
0	m_0 1	m_1 x	m_3 x	m_2 1	0	m_0 x	m_1 1	m_3 1	m_2 x
1	m_4 1	m_5 x	m_7 x	m_6	1	m_4 x	m_5 1	m_7 x	m_6 x

2 points

(b)



4 points

.Digital Design With An Introduction to the Verilog HDL, VHDL, and SystemVerilog, Sixth Edition – Solution Manual.
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