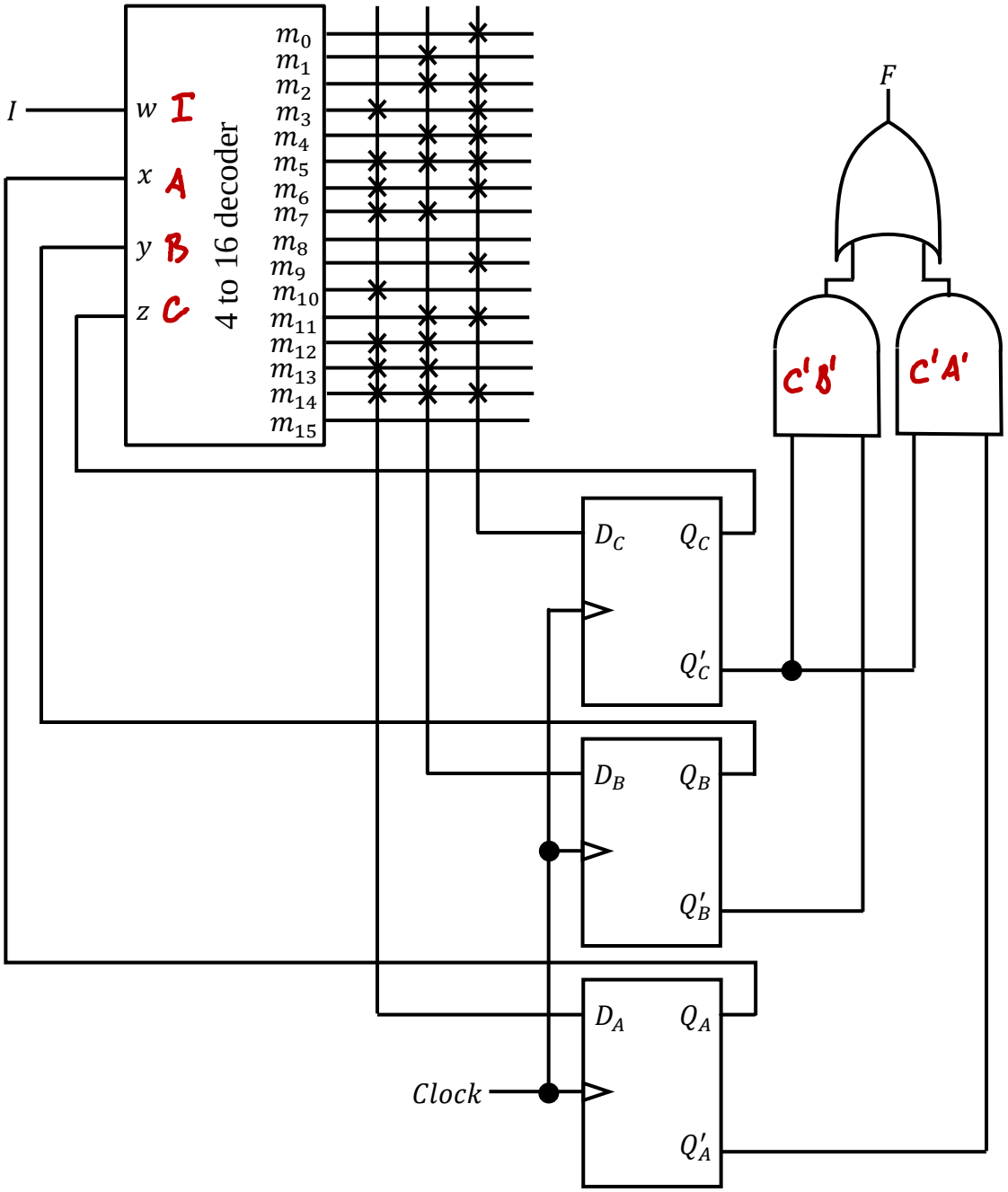
This is a 15 point problem



a) What type of state machine is this? Moore Machine? Mealy Machine?

b) Determine the expression for the flip-flop inputs, which are the outputs of the ROM, in compact *m*-notation. The minterms in the decoder are in *wxyz* order (e.g. m_2 is for $wxyz = 0010$).

$D_A(I,A,B,C) =$ 3, 5, 6, 7, 10, 12, 13, 14 $D_B(I,A,B,C) =$ 1, 2, 4, 5, 7, 11, 12, 13, 14

$D_C(I,A,B,C) =$ 0, 2, 3, 4, 5, 6, 9, 11, 14

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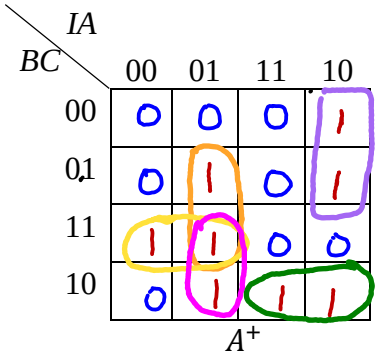
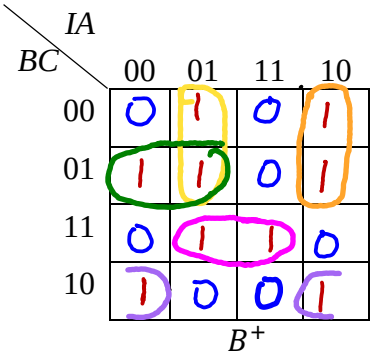
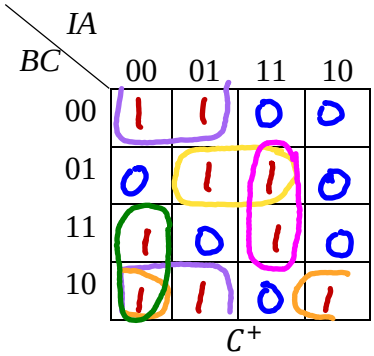
c) Complete these Next-State Maps for the flip-flops. Do not change any of the labels on the maps.







d) Complete this Transition Table for the state machine. Do not change any headings or values typed into the table. Note that the left column is not in "truth table order."

	Present State	Next State		Present Output
		$I = 0$	$I = 1$	
	$A\ B\ C$	$A^+\ B^+\ C^+$	$A^+\ B^+\ C^+$	F
0 8	0 0 0	0 0 1	0 0 0	1
1 9	0 0 1	0 1 0	0 0 1	0
2 11	0 1 1	1 0 1	0 1 1	0
3 10	0 1 0	0 1 1	1 0 0	1
4 12	1 0 0	0 1 1	1 1 0	1
5 13	1 0 1	1 1 1	1 1 0	0
6 15	1 1 1	1 1 0	0 0 0	0
7 14	1 1 0	1 0 1	1 1 1	0

$C'B' + C'A'$

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e) Using the following state definitions, complete the State Table. Note the different row order! Do not change any headings or values typed into the table.

S_0 $(ABC = 000)$, S_1 $(ABC = 001)$, S_2 $(ABC = 010)$, S_3 $(ABC = 011)$

S_4 $(ABC = 100)$, S_5 $(ABC = 101)$, S_6 $(ABC = 110)$, S_7 $(ABC = 111)$

Present State	Next State		Present Output
	$I = 0$	$I = 1$	F
S_0	S_1		
S_1	S_2		
S_2	S_5		
S_3	S_3		
S_4	S_3		
S_5			
S_6			
S_7			

f) Draw the properly formatted State Graph.