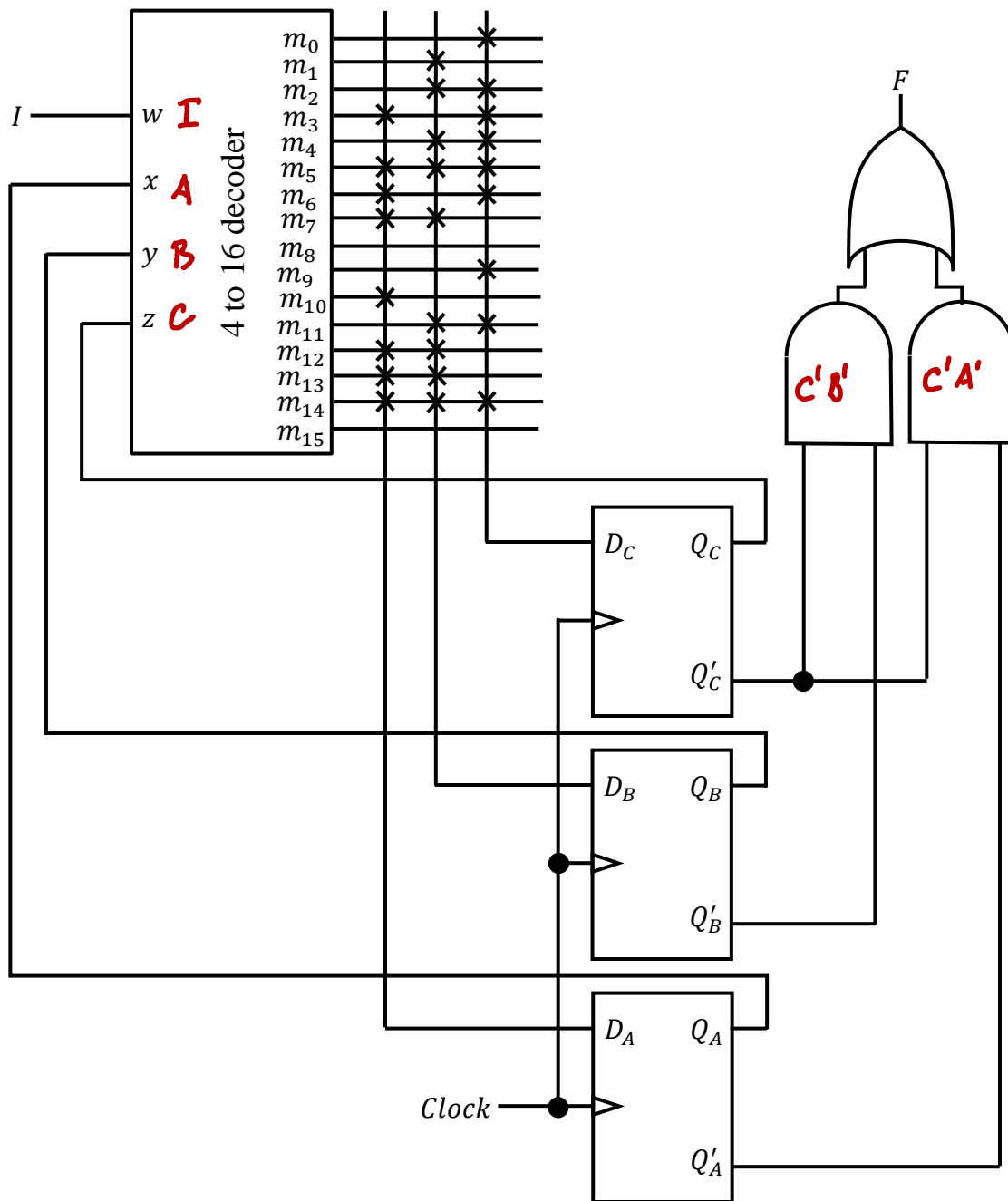


This is a 15 point problem



a) What type of state machine is this?

Moore Machine?

Mealy Machine?

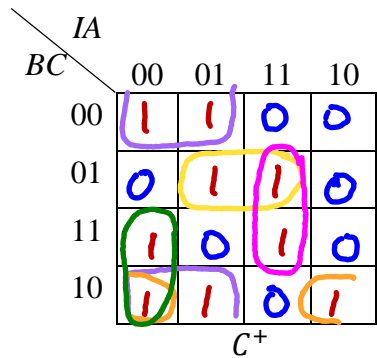
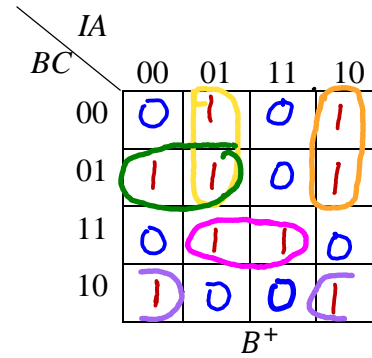
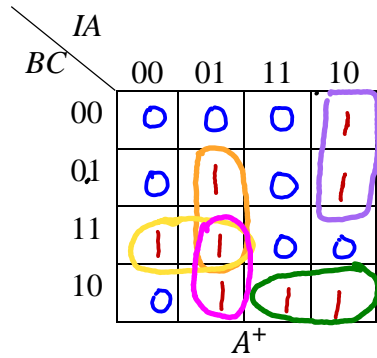
b) Determine the expression for the flip-flop inputs, which are the outputs of the ROM, in compact m -notation. The minterms in the decoder are in $wxyz$ order (e.g. m_2 is for $wxyz = 0010$).

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

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

Continued next page

- 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

$$C'B' + C'A'$$

Continued next page

- 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 F
	$I = 0$	$I = 1$	
S_0	S_1	S_0	1
S_1	S_2	S_1	0
S_2	S_3	S_2	0
S_3	S_3	S_4	1
S_4	S_3	S_6	1
S_5	S_7	S_6	0
S_6	S_6	S_0	0
S_7	S_5	S_7	0

- f) Draw the properly formatted State Graph.

