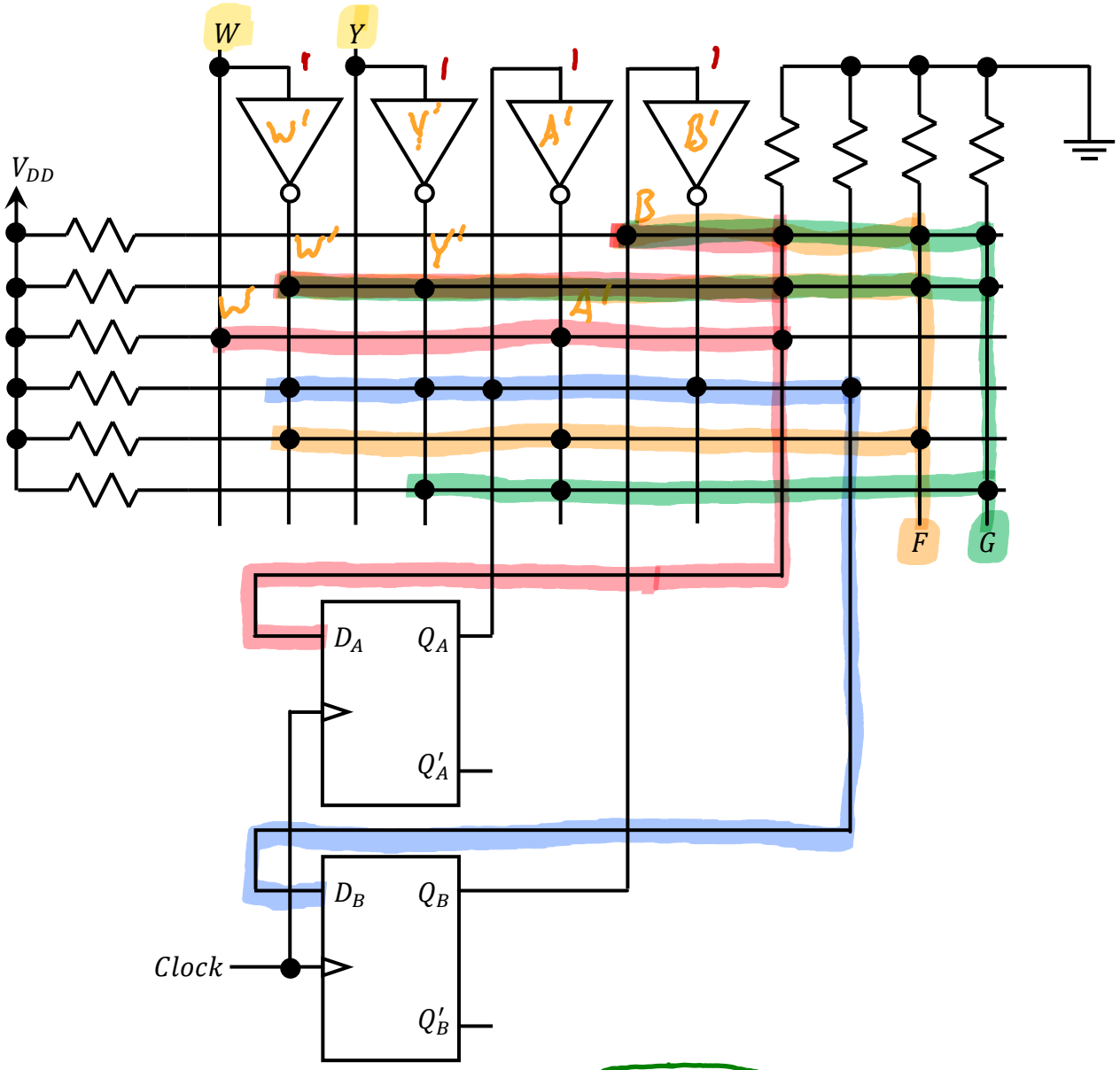
This is a 15 point problem



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

b) Determine the Boolean expressions implemented by the PLA for the flip-flop inputs (D_A and D_B) and circuit outputs (F and G). All expressions should be in terms of the circuit inputs (W and Y) and flip-flop outputs ($A = Q_A$, $B = Q_B$). [For example, $D_A(W, Y, A, B) = \ldots$]

c) Determine the Next-State Maps for both flip-flops and the Output Maps for both outputs. [total of four maps].

d) Determine the Transition Table for the state machine.

e) Using the following state definitions, determine the State Table.
S_0 $(AB = 00)$, S_1 $(AB = 01)$, S_2 $(AB = 10)$, S_3 $(AB = 11)$

f) Draw the properly formatted State Graph.

g) Comment on what is unusual about state S_1.

b)

$D_A(W, Y, A, B) = 0, 1, 2, 3, 5, 7, 8, 9, 11, 12, 13, 15$

$D_B(W, Y, A, B) = 2$

c)

Present State (D_A)	Inputs (WYB)	Next state (D_A^+)
0	000	1
0	001	1
0	010	0
0	011	1
0	100	1
0	101	1
0	110	1
0	111	1
1	000	1
1	001	1
1	010	0
1	011	1
1	100	0
1	101	1
1	110	0
1	111	1

Present State (D_B)	Inputs (WYA)	Next state (D_B^+)
0	000	0
0	001	1
0	010	0
0	011	0
0	100	0
0	101	0
0	110	0
0	111	0
1	000	0
1	001	0
1	010	0
1	011	0
1	100	0
1	101	0
1	110	0
1	111	0

F

AB \ WY	00	01	11	10
00	1	1	0	0
01	1	1	1	1
11	1	1	1	1
10	1	0	0	0

G

AB \ WY	00	01	11	10
00	1	0	0	1
01	1	1	1	1
11	1	1	1	1
10	1	0	0	0

d) e?)

Input	WY = 00		WY = 01		WY = 10		WY = 11	
Present State	Next state	Output (FG)	Next state	Output (FG)	Next state	Output (FG)	Next state	Output (FG)
S_0	S_2	11	S_0	10	S_2	01	S_2	00
S_1	S_2	11	S_2	11	S_2	11	S_2	11
S_2	S_3	11	S_0	00	S_0	00	S_0	00
S_3	S_2	11	S_2	11	S_2	11	S_2	11

$S_0 = 00$

$S_1 = 01$

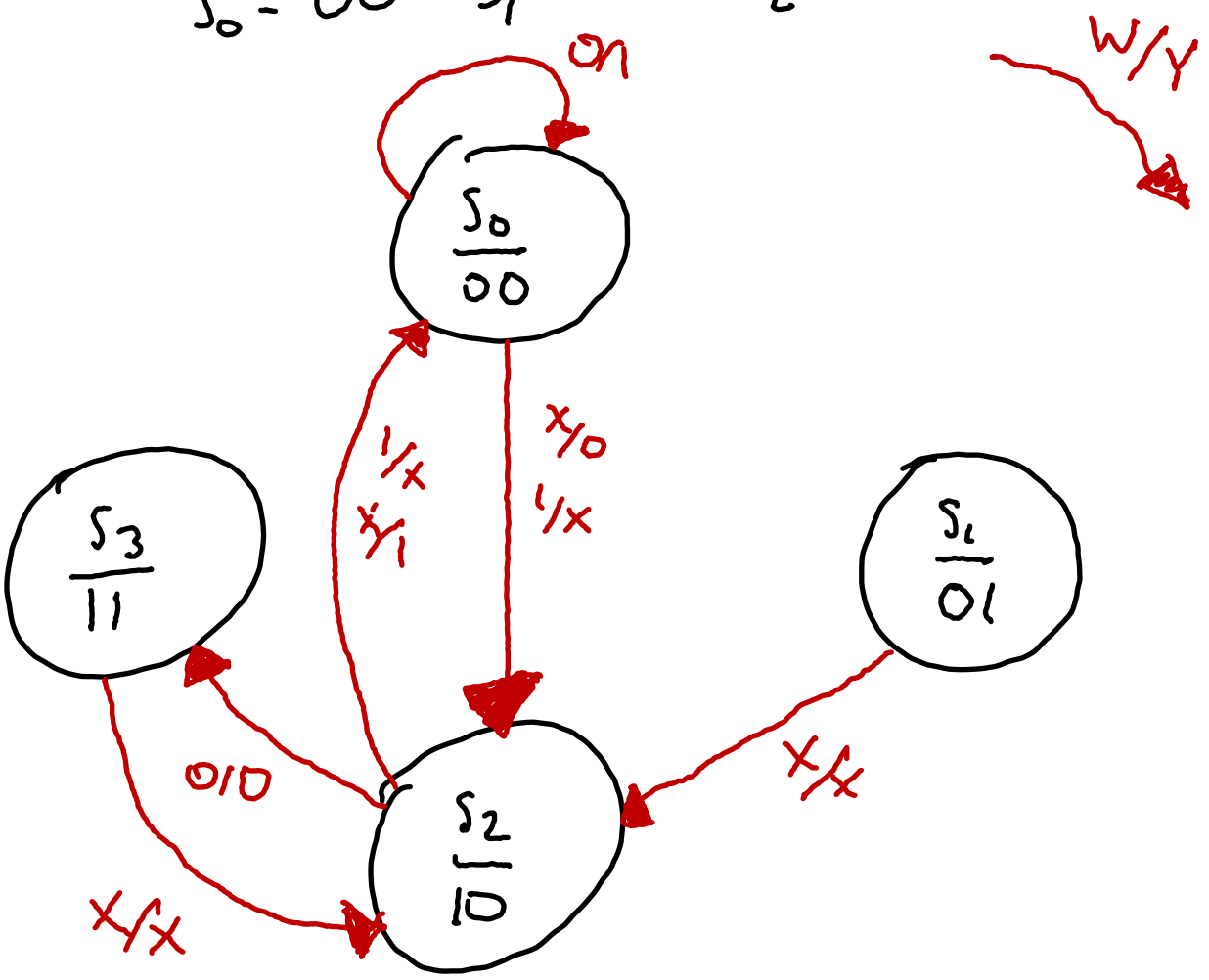
$S_2 = 10$

$S_3 = 11$

f)

$S = AB$

$S_0 = 00 \quad S_1 = 01 \quad S_2 = 10 \quad S_3 = 11$



g) State S_1 is unusual because there is no way to intentionally reach it.