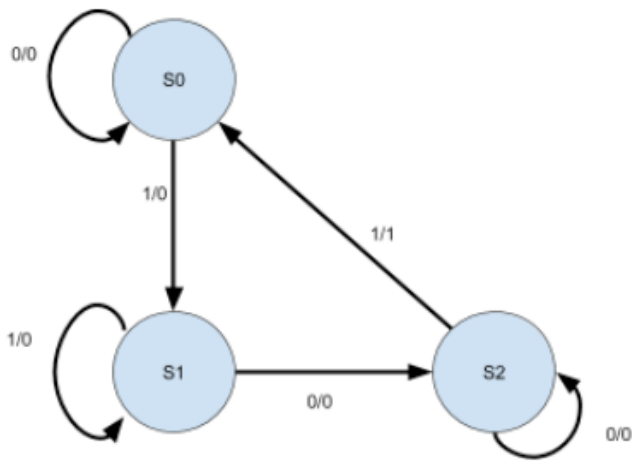2) This Mealy machine with states S0, S1 and S2 and output Y is transformed into a Moore machine with states S0, S1, S2 and S3 (where the Mealy S0 became the Moore S0 and S3 states).

Complete this table for the Mealy Machine. Each entry should have a state name and an output in the following format (e.g. S0,0) - **NO spaces please. We filled out the first entry for you as an example.**

State\Input	0	1
S0	S0,0	S1,0
S1	S2,0	S1,0
S2	S2,0	S0,1

Complete the table for the equivalent Moore machine. For the state boxes, put only S0, S1, S2, or S3. For the output boxes put only a 0 or 1. We filled out one of the Y outputs for you.

State\Input	0	1	Y
S0	S0	S1	0
S1	S2	S1	0
S2	S2	S3	0
S3	S0	S1	1

2. Given the following prime implicant table from **a** QM reduction, which terms are essential prime implicants? (Choose the letter(s) corresponding to the essential prime implicants.)

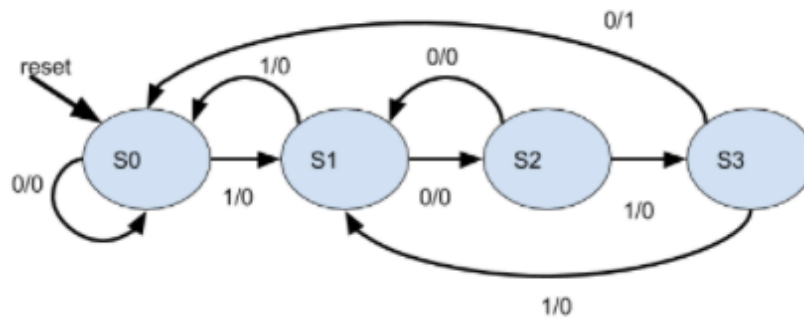| implicant	m1	m3	m5	m8	m10	m11	m12	m15	m18	m20	m25
A	x						x	x			x
B		x		x			x			x	
C	x			x		x					x
D			x		x	x				x	
E	x				x						x
F	x	x		x			x		x	x	x

☐ B

☐ None of them are essential

☐ D

☐ E

☐ C

☐ F

☐ A

Q2]

Complete the following statements

After reset, and the input sequence 1, 1, 1, 1, 0, 0 the machine is in state (enter S0, S1, S2, or S3)

[S0]

After reset, and the input sequence 1, 0, 1, what will the output be if the next input is 1 (enter 0 or 1)

[0]

If a one-hot encoding is used for this state machine, what is the minimum number of state registers (flip flops) that one can use (enter an integer) [4]

For each of the following sequence, mark those that will be recognized (will output a 1) with T and those that will not be recognized (output a 0) with F (assume the initial state in all cases is S0)

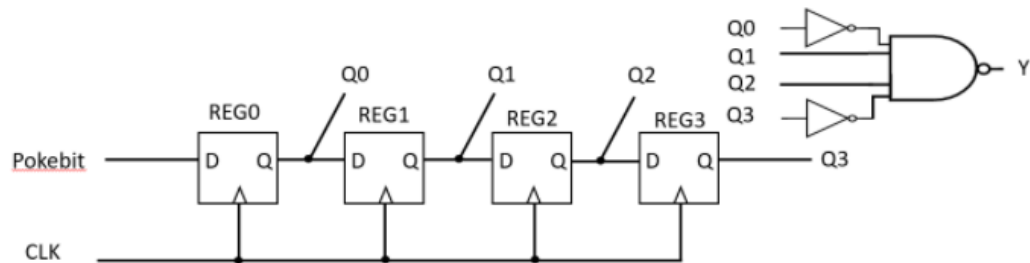| Sequence	Answer
1010	T
1100	F
100010	T
111001	F
10001100010	T

Question 3   3 pts

3) Given the following diagram:

Assume Pokébits shift in leftmost bit first, right most bit last from a serial port. What pattern will cause Y = 0 after 4 bits are shifted in? (assume all the registers start out with the value 0 and the first bit in the list is the first bit to shift in).
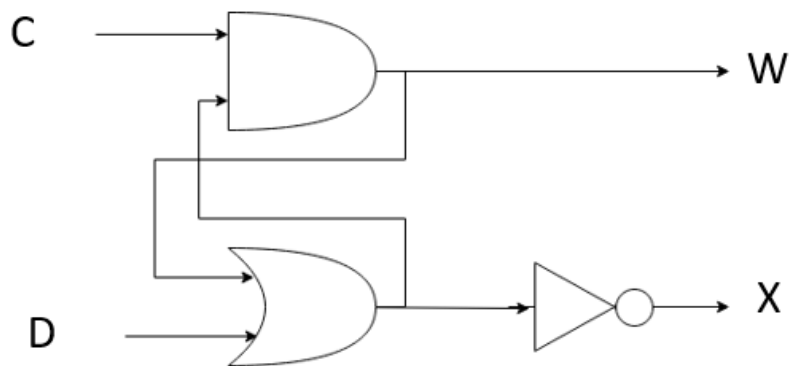
○ 0,0,0,1

○ 0,1,1,0

○ 1,0,0,1

○ 0,1,0,1

○ 1,0,1,0

5)

What inputs should (C, D) be to set the circuit, i.e. W=1, X=0 ?