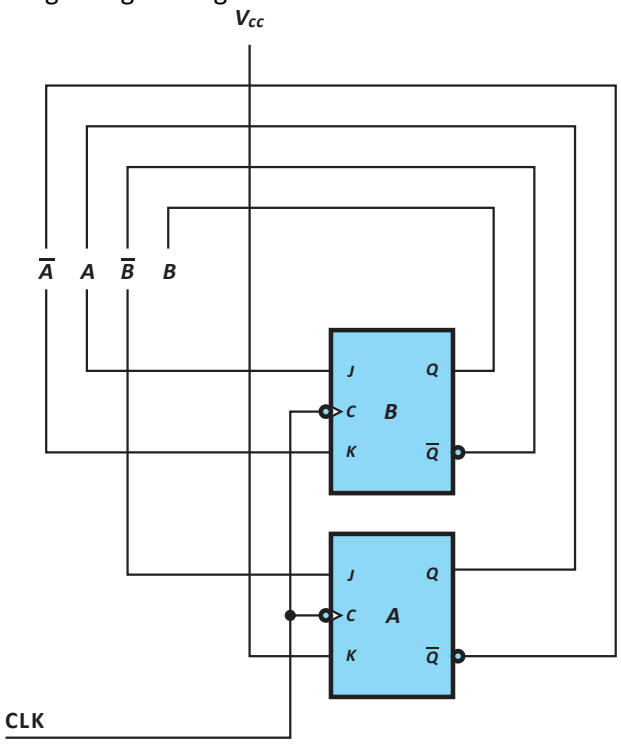
Author Identification Block

Author: Mr. Alan Turing
Student ID: *00000001
E-Mail: aturing@uco.edu
Course: CMSC 2833 – Computer Organization I
CRN: 13097 Autumn 2020
Assignment: a07
Due: November 3, 2020

Scoring block			
Exercise	**Maximum**	**Earned**	**Explanation**
1	3	3	
2	3	3	
3	3	3	
4	3	3	
5	3	3	
Total	**15**	**15**	

1. Analyze the circuit whose logic diagram is given below.



Logic Diagram for Exercise 1

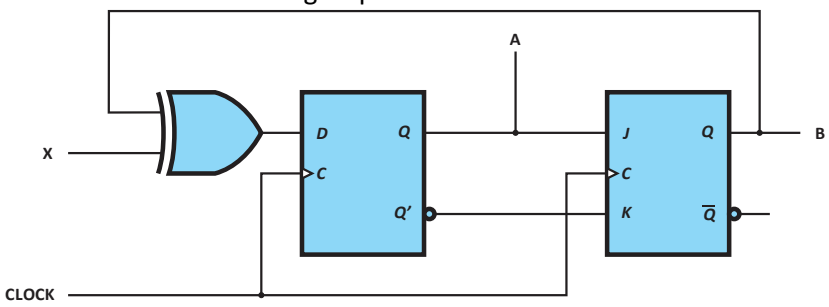
(a) Determine the equations for the next state decoder.
Solution:

(b) Complete K-Maps for the next state decoder.
Solution:

(c) Complete the Present-State-Next-State Table.
Solution:

(d) Draw a state diagram for the circuit.
Solution:

2. Complete the truth table for the following sequential circuit.



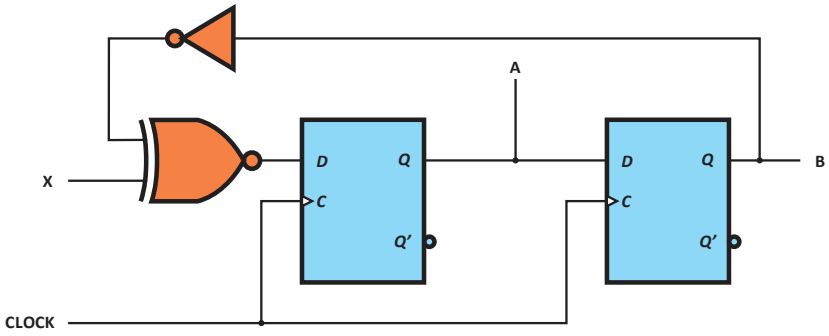
Sequential Circuit for Exercise 2

			Next State	
A	***B***	***X***	***A***	***B***
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

Truth Table for Exercise 2

Solution:

3. Complete the truth table for the following sequential circuit.



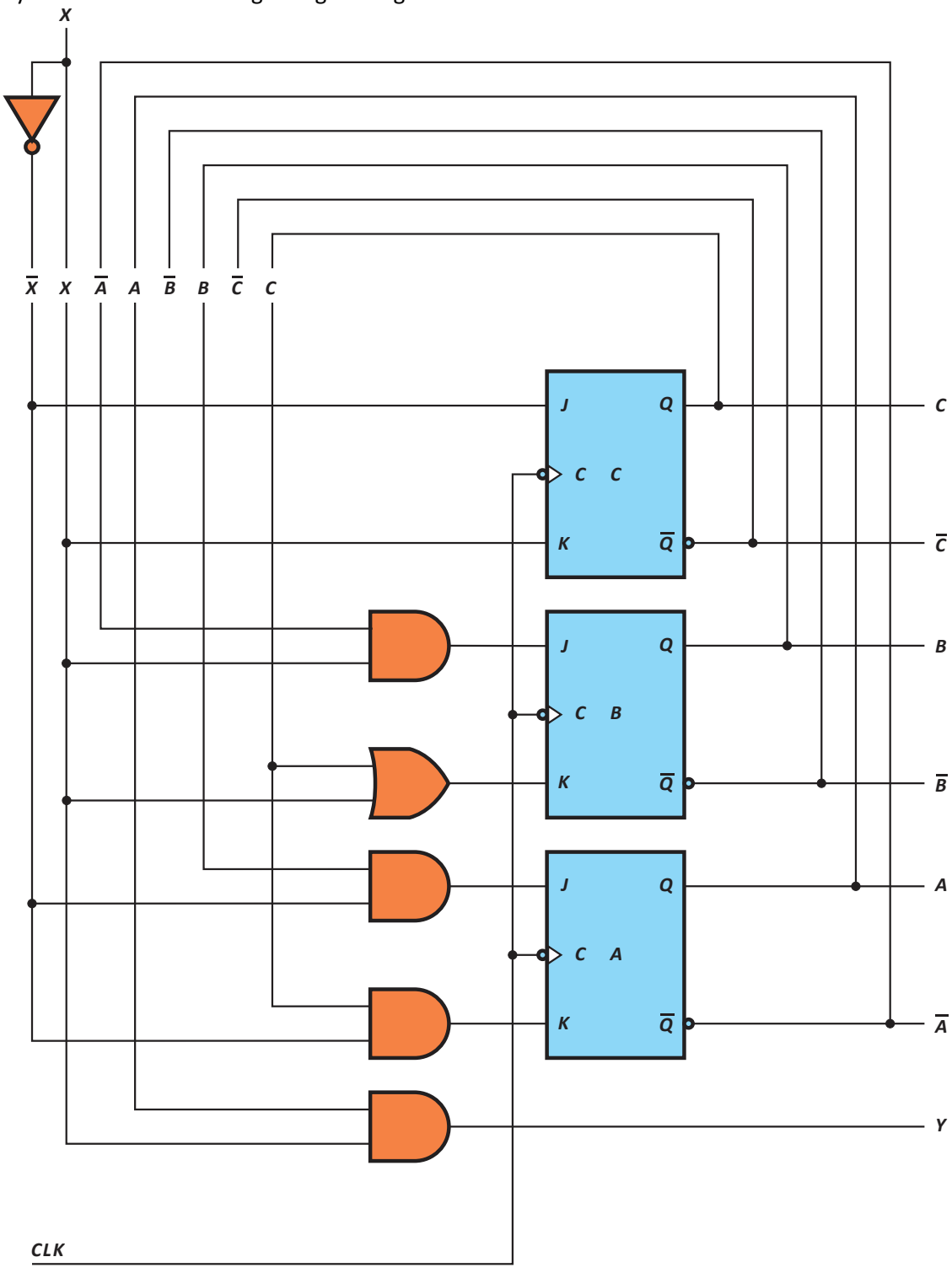
Sequential Circuit for Exercise 3

			Next State	
A	***B***	***X***	***A***	***B***
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

Truth Table for Exercise 3

Solution:

4. Analyze the circuit whose logic diagram is given below.



Logic Diagram for Exercise 4

(a) Determine the equations for the next state decoder.

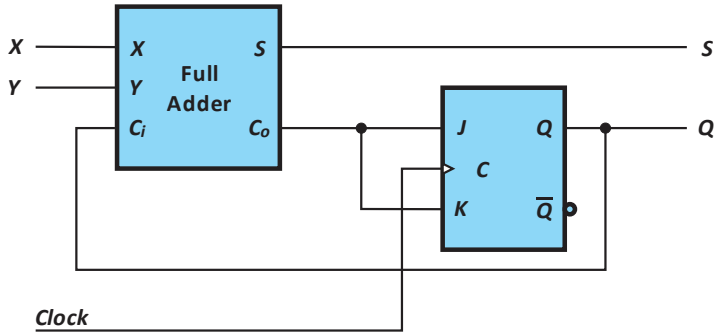
Solution:

(b) Complete K-Maps for the next state decoder.
Solution:

(c) Complete the Present-State-Next-State Table.
Solution:

(d) Draw a state diagram for the circuit.
Solution:

5. A sequential circuit has one flip-flop; two inputs, X and Y; and one output, S. It consists of a full-adder circuit connected to a JK flip-flop, as shown. Fill in the truth table for this sequential circuit by completing the Next State and Output columns.



Present State Q(t)	Inputs X	Y	Next State Q(t+1)	Output S
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

Solution: