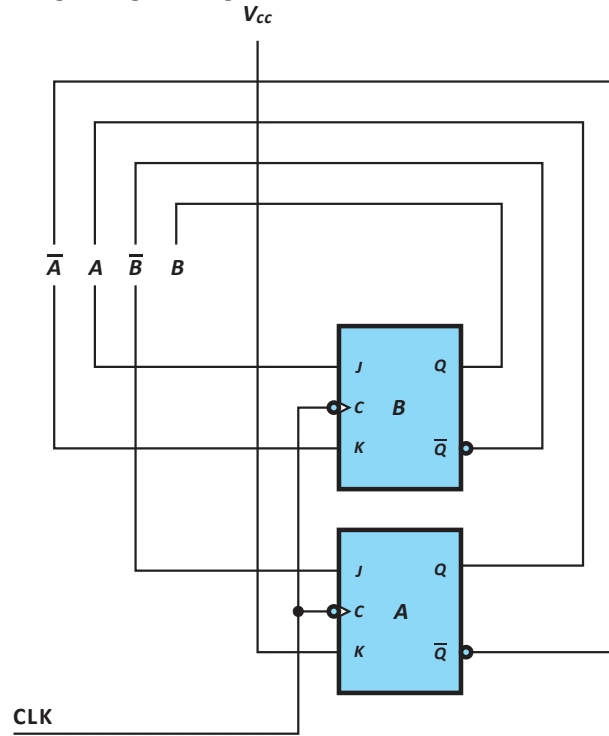


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Course: CMSC 2833 – Computer Organization I
Assignment: a07
Due: November 3, 2020

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:

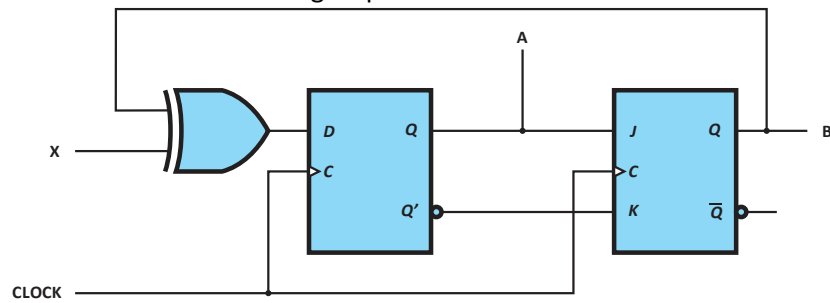
- (c) Complete the Present-State-Next-State Table.

Solution:

- (d) Draw a state diagram for the circuit.

Solution:

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



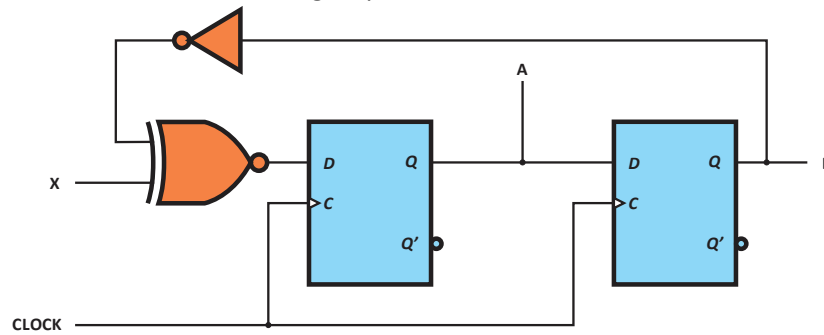
Sequential Circuit for Exercise 2

A	B	X	Next State	
			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.



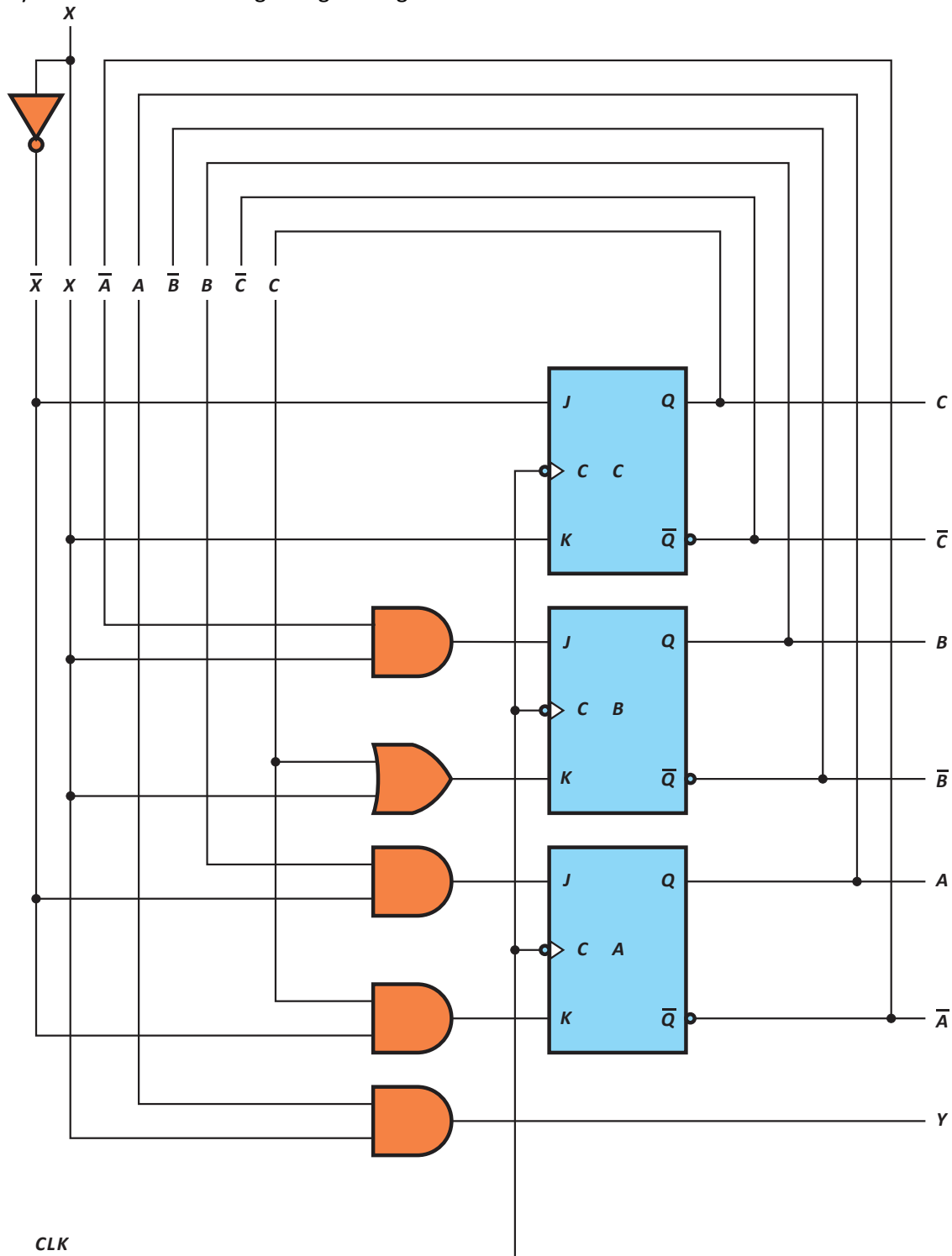
Sequential Circuit for Exercise 3

A	B	X	Next State	
			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:

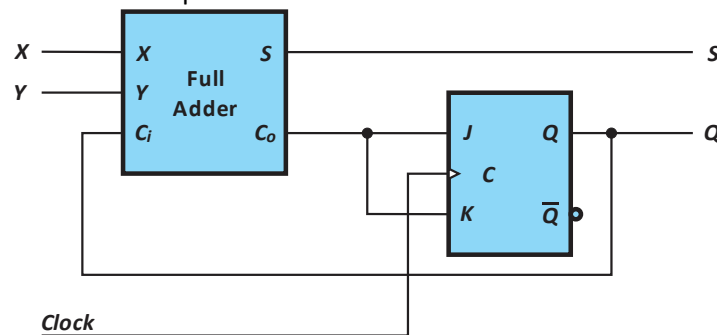
(c) Complete the Present-State-Next-State Table.

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: