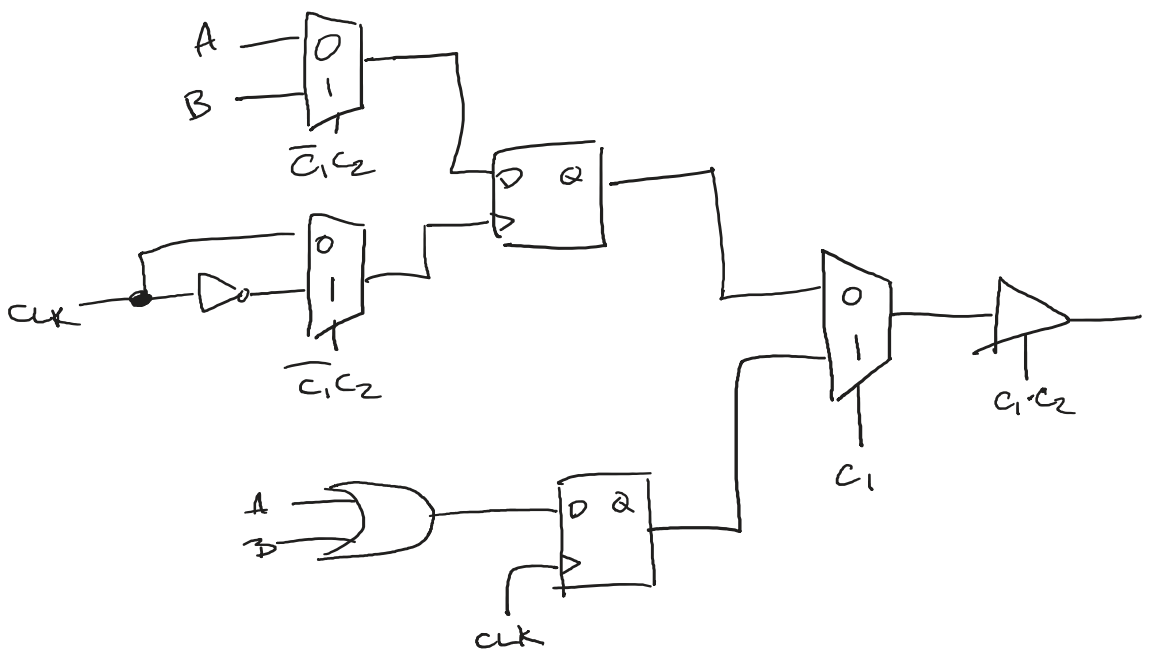
Lotito - ECE428 HW2

Sunday, February 16, 2025 2:25 PM

1. Design a programmable circuit block with the following specifications. Show your implementation.
   a. Input ports: A, B
   b. Clock input port: clk
   c. Output port: Q
   d. Configuration inputs: C1, C2
   e. Its functions are given below:

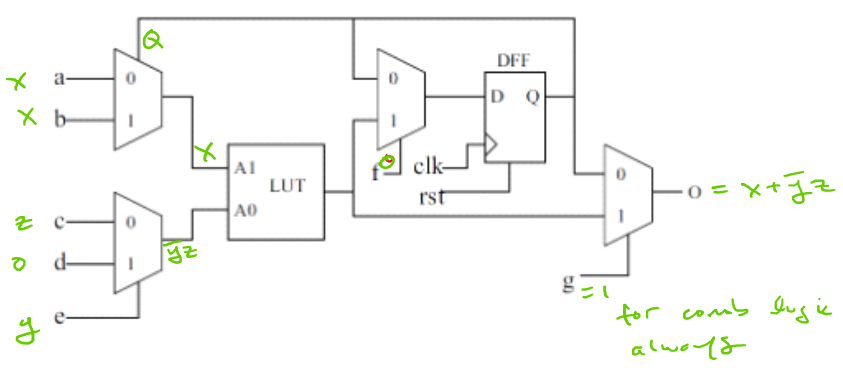
C1 C2	Circuit function
0 0	Positive edge triggered DFF, the DFF input is A and output is Q
0 1	Negative edge triggered DFF, the DFF input is B and output is Q
1 0	Positive edge triggered DFF, the DFF input is (A+B) and output is Q
1 1	Circuit output is at high impedance state

SYSTEM BOM
(1) 2-TO-1 MUX FOR D & T CLK
(2) OR GATE
(3) MUX TO SEND SIGNAL THROUGH OR GATE.
(4) TRI-STATE BUFFER



2. The following is a programmable cell. Fill the following tables to show how to program the cell for implementing function $O = x + \bar{y} \cdot z$

↳ combinational



a	b	c	d	e	f	g
X	X	z	0	y	0	1

(Fill the tabel with 0, 1, x, y, z)

Address A1 A0	00	01	10	11
{x, ȳz}	0	1	1	1

$A_1 = x$
$A_0 = \bar{y}z$

A_1A_0	y
0 0	0
0 1	1
1 0	1
1 1	1