

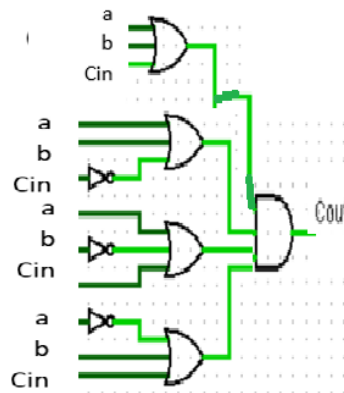
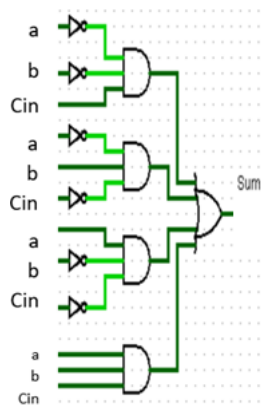
Q1) Sketch the circuits for the FULL adder using **basic gates ONLY** (and,or,not) (Don't use XOR).

A basic concept in this course is to be able build a two level AND/OR circuit using the TRUTH TABLE.

Ley us build the FULL adder truth table:

.. a b c_{in}	Sum	C_{out}
0 0 0	0	0
0 0 1	1	0
0 1 0	1	0
0 1 1	0	1
1 0 0	1	0
1 0 1	0	1
1 1 0	0	1
1 1 1	1	1

The rest is consider the minterms that their output is 1 (and build AND/OR circuit) or Maxterms that their output is 0 (and build OR/AND) circuit. Below I am sketching the SUM function using minterms while the Cout using maxterms.



Q2)

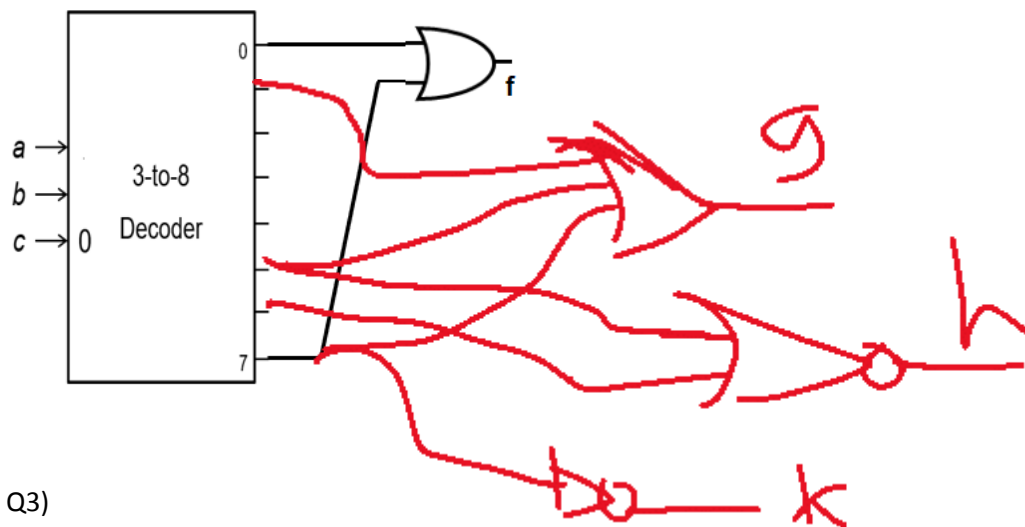
a) Consider the circuit in the figure below, write f as a sum of minterms. $f = a'b'c' + abc$

b) Write f as product of minterms. $f = \prod(1, 2, 3, 4, 5, 6)$

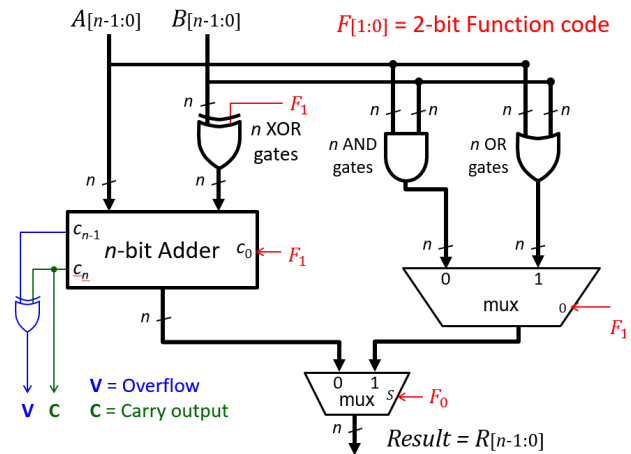
c) On the same figure sketch how you can generate the function g where $g = \sum(1, 5, 7)$

d) On the same figure sketch how you can generate the function h where $h = \prod(5, 6)$

e) On the same figure sketch how you can generate the function k where $k = (a' + b' + c')$



Q3)



In the above circuit $n=8$, $A=0xDD$, $B=0xF0$, $F=1$, What is R ?

The operation is (A AND B) (Bitwise ANDING) . $R= D0$

In the above circuit $n=8$, $A=45$, $B=20$, $F=0$, What is R ?

The operation is (A + B) (Addition) . $R= 65$