Lab 3: Logical expressions

(20) Part1: Simplification Example

Simplify following equations. Show your work. Draw simplified circuit in Logisim.

a.) (10 points)

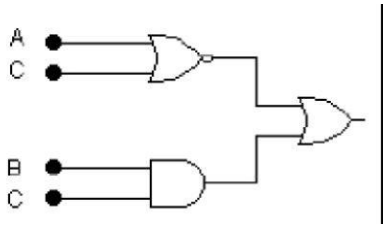
F = A'B'C' +A'B'(C'+C)+ABC

b.) (10 points)

F = A' + A'B'C'D' + A'B'CD' + A'B + A'B'C'D' + C'D + CD'

(30) Part2: Reverse Engineering

For the following circuit, derive its truth table and write down 'sum of minterms' and 'product of maxterms'.



(50) Part3: Circuit Implementation

Using Logisim, design a 3-input circuit that outputs a "1" when the corresponding binary

Inputs represent an even number between 1 and 5 (2,4) following these steps:

1. Draw the truth table.
2. Obtain logical expression in sum-of-minterms and simplify it (result = (A ⊕ B) C'). Draw circuit in Logisim.
3. Implement circuit on breadboard.

We will be using AND (7408), INVERTER (7404), XOR (7486) chips to implement this circuit.