ASSIGNMENT #2

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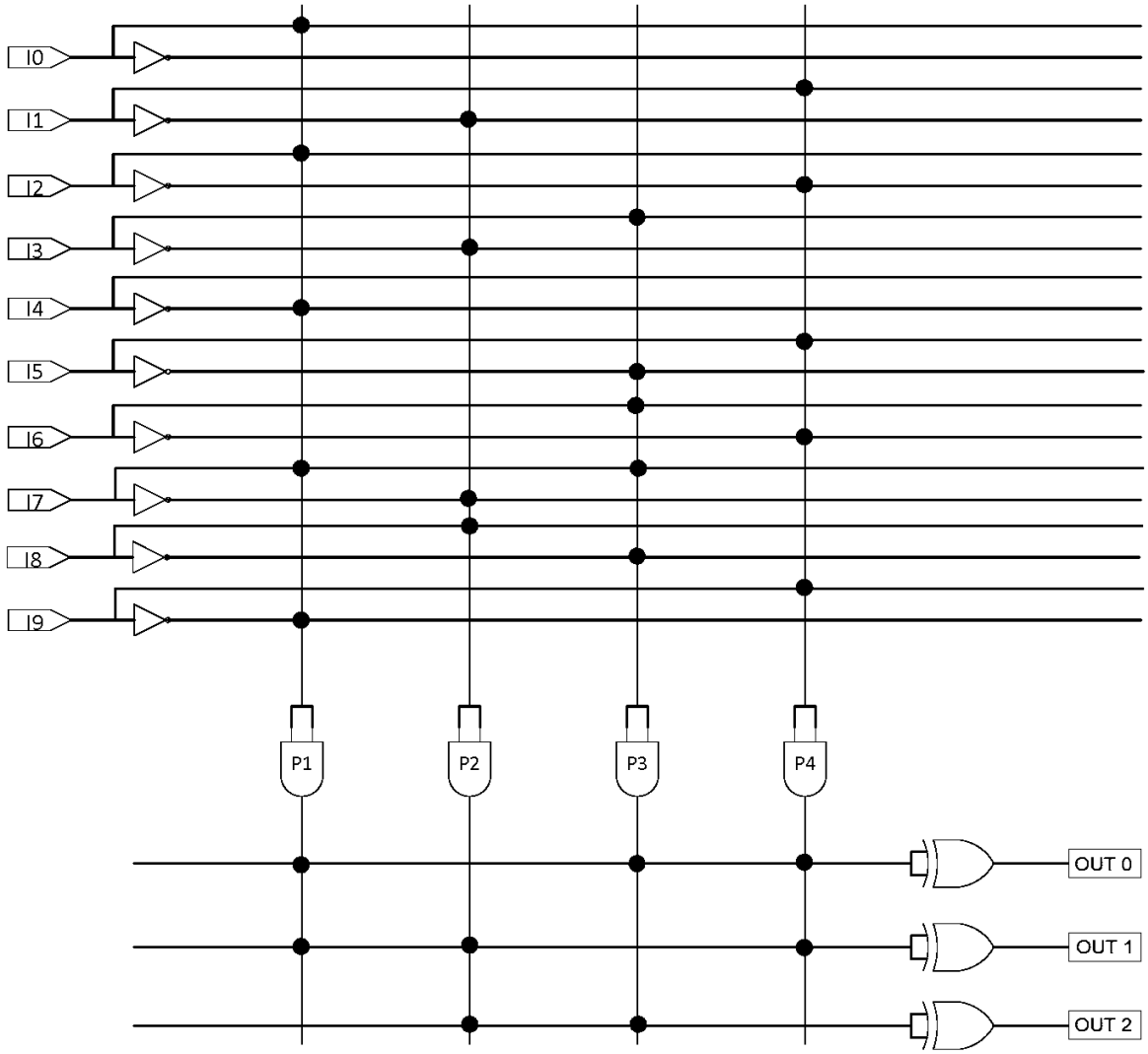
Question #1

You are given a customized PLA based device (programming AND & programmable XOR arrays) having 10 inputs and 3 outputs.

You are required to perform the stated operations:

- Generate the basic Boolean Expression of the stated circuit.
- Convert the generated Boolean Expression into ABEL Expression.



Solution

First we generate the basic Boolean Expression of the stated circuit,

Points	I	II	III	IV	V
P1	i0	i2	i4’	i7	i9’
P2	i1’	i3’	i7’	i8	
P3	i3	i5’	i6	i7	i8’
P4	i1	i2’	i5	i6’	i9

We get the following generated product terms,

P1 = i0.i2.i4’.i7.i9’

P2 = i1’.i3’.i7’.i8

P3 = i3.i5’.i6.i7.i8’

P4 = i1.i2’.i5.i6’.i9

For given OUTPUT are:

O1 = P1 ⊕ P3 ⊕ P4
O2 = P1 ⊕ P2 ⊕ P4
O3 = P2 ⊕ P3

By putting the values of product terms in OUTPUT,

O1 = i0.i2.i4’.i7.i9’ ⊕ i3.i5’.i6.i7.i8’ ⊕ i1.i2’.i5.i6’.i9
O2 = i0.i2.i4’.i7.i9’ ⊕ i1’.i3’.i7’.i8 ⊕ i1.i2’.i5.i6’.i9
O3 = i1’.i3’.i7’.i8 ⊕ i3.i5’.i6.i7.i8’

Now, converting the generated Boolean Expression into ABEL Expression,

O1 = i0 &i2 &!i4 &i7 &!i9 $ i3 &!i5 &i6 &i7 &!i8 $ i1 &!i2 &i5 &!i6 &i9
O2 = i0 &i2 &!i4 &i7 &!i9 $!i1 &!i3 &!i7 &i8 $ i1 &!i2 &i5 &!i6 &i9
O3 = !i1 &!i3 &!i7 &i8 $ i3 &!i5 &i6 &i7 &!i8