BLG231 Digital Circuits HW3

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index	a	b	c	d	f
0	0	0	0	0	1
1	0	0	0	1	Φ
2	0	0	1	0	Φ
3	0	0	1	1	Φ
4	0	1	0	0	1
5	0	1	0	1	1
6	0	1	1	0	0
7	0	1	1	1	0
8	1	0	0	0	Φ
9	1	0	0	1	1
10	1	0	1	0	Φ
11	1	0	1	1	0
12	1	1	0	0	1
13	1	1	0	1	0
14	1	1	1	0	1
15	1	1	1	1	0

1)

AB/CD	00	01	11	10
00	1	Φ	Φ	Φ
01	1	1	0	0
11	1	0	0	1
10	Φ	1	0	Φ

All prime implicants:

$A'B', B'D', AD', A'C', B'C', C'D'$

2)

	0	4	5	9	12	14	Cost
$A'B'$	x						6
$B'D'$	x						6
$C'D'$	x	x			x		6
AD'					x	x	5
$A'C'$	x	x	x				6
$B'C'$	x			x			6

$A'B'$ and $B'D'$ is covered by $C'D'$ and their costs are equal to $C'D'$s cost. We can eliminate $A'B'$ and $B'D'$.

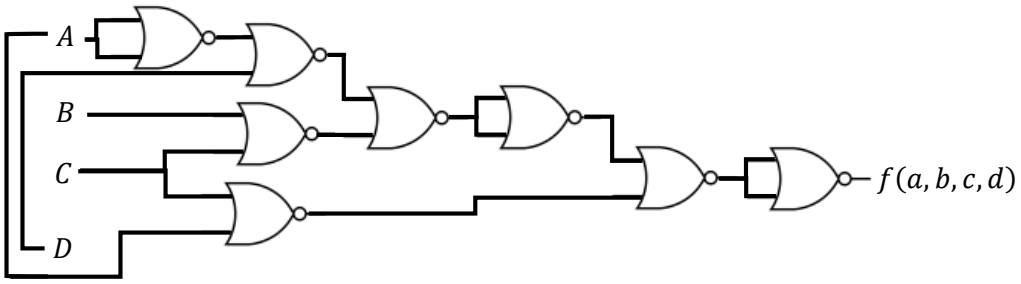
$A'C'$ covers 0101 distingushied point.

$B'C'$covers 1001 distingushied point.

AD' covers 1110 distingushied point.

$f = A'C' + AD' + B'C'$ Total cost is 17.

3)



$f(a,b,c,d) = (A + C)' + (A' + D)' + (B + C)'$

4)

index	a	b	c	d	f
1	0	0	0	1	1
2	0	0	1	0	0
3	0	0	1	1	0
8	1	0	0	0	1
10	1	0	1	0	1

Don't care values have values on the table when circuits simulated on Logism.

Most optimum function have the values on the table and that's why those values are generated.