

HW 3 solution part 1

#1

a)

		AB			
C		00	01	11	10
0	0	0	1	1	0
1	1	1	0	1	0

Minimized term: $BC' + AB + A'B'C$

b)

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

Minimized term: $ABD' + ACD + B'D + A'B'C'$

c)

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

Minimized term: $A'B + A'CD' + BC'D + AB'D'$

d)

$F = ABC + ABCD + A'B'C + A'B'D'$

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

Minimized term: $ABC + A'B'C + A'B'D'$

e)

$$F' = AB'C' + A'B'CD' + A'BC'D + AB$$

AB

CD	00	01	11	10
00	1	1	0	1
01	1	0	0	1
11	1	1	0	1
10	0	1	0	1

$$F = AB' + A'BD' + A'CD + B'C'$$

5

a) 17 terms totally.

b)

$$BC' + AB + A'B'C$$

$$\Rightarrow ABD' + A'BC' + ABD + ABC' + A'B'C + ABC + ABC'$$

$$ABD' + ACD + B'D + A'B'C'$$

$$\Rightarrow ABD' + ACD + AB'D + A'B'D + CB'D + C'B'D + A'B'C'$$

$$A'B + A'CD' + BC'D + AB'D'$$

$$\Rightarrow A'BC + A'BC' + A'BD + A'BD' + A'CD' + BC'D + AB'D'$$

$$ABC + A'B'C + A'B'D'$$

$$\Rightarrow ABC + A'B'C + A'B'D'$$

$$AB' + A'BD' + A'CD + B'C'$$

$$\Rightarrow AB'C + AB'C' + AB'D + AB'D' + A'BD' + A'CD + AB'C' + A'B'C'$$

shared terms:

A'B'C is shared between 1 and 4.

ABD' is shared between 1 and 2.

ABC is shared between 1 and 4.

A'B'C' is shared between 2 and 5.

AB'D is shared between 2 and 5.

A'BD' is shared between 3 and 5.

AB'D' is shared between 3 and 5.

A'BC' is shared between 1 and 3.

7 shared terms + 32 - 14 \Rightarrow 25 unique terms.

