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Elec 2200

09/13/21

Hw 8

1.

x	y	z	Q
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

z \ xy	00	01	11	10
0	0	1	0	1
1	0	0	1	1

min terms: 2, 5, 6, 7

max terms: 0, 1, 3, 4

SOP: $010 + 100 + 101 + 111$

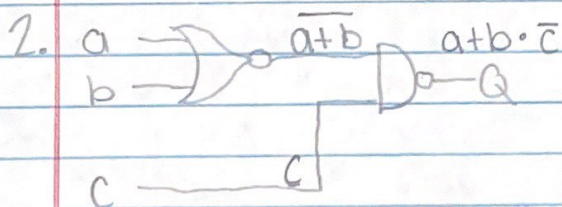
$\bar{x}y\bar{z} + x\bar{y}\bar{z} + x\bar{y}z + xyz$

$\bar{y}\bar{z}(x\bar{y} + x + xz) + xyz$

$= \bar{y}\bar{z}(y + xz) + xyz$

$= y + xz + x$

$= y + xz$



a	b	c	a+b	a+b · c
0	0	0	0	0
0	0	1	0	0
0	1	0	1	1
0	1	1	1	0
1	0	0	1	1
1	0	1	1	0
1	1	0	1	1
1	1	1	1	0

c \ ab	00	01	11	10
0	0	1	1	1
1	0	0	0	0

min terms: 2, 4, 6

max terms: 0, 1, 3, 5, 7

3. $Q = ab + \bar{a}c$

a	b	c	\bar{a}	ab	$\bar{a}c$	$ab + \bar{a}c$
0	0	0	1	0	0	0
0	0	1	1	0	1	1
0	1	0	1	0	0	0
0	1	1	1	0	1	1
1	0	0	0	0	0	0
1	0	1	0	0	0	0
1	1	0	0	1	0	1
1	1	1	0	1	0	1

c \ ab	00	01	11	10
0	0	0	0	0
1	1	1	0	0

min term: 1, 3

max terms: 0, 2, 4, 5, 6, 7

4.

ab \ c	00	01	11	10
00	1	0	1	1
01	0	0	0	0
11	0	0	1	0
10	1	0	0	0

$m(0, 2, 8, 12, 15)$

$M(1, 3, 4, 5, 6, 7, 9, 10, 11, 13, 14)$

POS: $0001 + 0011 + 0100 + 0101 + 0111 + 0110 + 1101 + 1110$
 $+ 1001 + 1011 + 1010$

$\bar{a}\bar{b}\bar{c}d + \bar{a}\bar{b}c\bar{d} + \bar{a}b\bar{c}\bar{d} + \bar{a}b\bar{c}d + \bar{a}b\bar{c}d + \bar{a}b\bar{c}d + a\bar{b}\bar{c}d + a\bar{b}c\bar{d}$
 $+ a\bar{b}c\bar{d} + a\bar{b}cd + a\bar{b}cd$

~~$\bar{a}\bar{b}\bar{c}d$~~ $(\cancel{d} + \cancel{d} + \cancel{b} + bd + bcd + bc + \cancel{abd} + abc + ad + acd + ac)$
 $= d + bd + bcd + bc + bd + abc + ad + acd + ac$

1. POS: $000 + 001 + 011 + 111$

$$\bar{x}\bar{y}\bar{z} + \bar{x}\bar{y}z + \bar{x}yz + xyz$$

$$\bar{x}(\bar{y}\bar{z} + \bar{y}z + yz + \underline{xyz})$$

$$= \bar{x}(z + z)$$

$$= \bar{x}z$$