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CSE 140
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CSE 140 HW 2

Problem 1

$M = (\{0, a, b, c\}, \#, 8)$

#	0	a	b	c
(A) 0	0	0	0	0
a	0	0	0	0
b	0	0	0	0
c	0	0	0	0

(and)

1) Yes, System is Boolean Algebra

2) $0=0$

$a=1$

$b=0$

$c=1$

(or)

1) Yes, System is Boolean Algebra

2) $0=0$

$a=1$

$b=0$

$c=1$

Problem 2

(S_2, S_1, S_0)

$(0, 0, 0); (0, 0, 1)$

$(0, 1, 0); (0, 1, 1)$

$(1, 0, 0); (1, 0, 1)$

$$y = S_2' S_1' S_0' + S_2' S_1' S_0 + S_2' S_1 S_0' + S_2' S_1 S_0 + S_2 S_1' S_0' + S_2 S_1' S_0 + S_2 S_1 S_0' + S_2 S_1 S_0$$

Problem 3

(d_2, d_1, d_0)

$(0, 0, 0); (0, 0, 1)$

$(0, 1, 0); (0, 1, 1)$

$(1, 0, 0); (1, 0, 1)$

$(1, 1, 0);$

$$y = d_2' d_1' d_0' + d_2' d_1' d_0 + d_2' d_1 d_0' + d_2' d_1 d_0 + d_2 d_1' d_0' + d_2 d_1' d_0 + d_2 d_1 d_0' + d_2 d_1 d_0$$

Problem 4

1) $f(a, b, c) = \sum m(1, 3, 4, 7) + \sum d(6)$

0	0	0	1
1	1	1	0

$$y = ac' + ab + a'c$$

$f(a, b, c, d) = \sum m(0, 1, 6, 9, 11, 15) + \sum d(2, 5, 10, 14)$

0	1	6	9
1	1	3	0
2	0	10	14
3	1	7	15

$$y = ac + cd' + a'bc' + bc'd'$$

Problem 5 1) $f(abc) = \sum m(1, 2, 7) + \sum d(3, 4)$

	b		c	
	0	1	0	1
a	1	0	1	0

$$y = (a + b')(a + c')(b' + c')$$

2) $f(abc d) = \sum m(3, 6, 11, 12) + \sum d(2, 5, 7, 13)$

	b		c	
	0	1	0	1
d	0	1	0	1
a	1	0	1	0

$$y = (a + b')(a + c + d)(a' + c + d') \cdot (b + c' + d')(a' + b' + c')$$