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Prof. Li

Homework 8

1(1). $F(A,B,C) = (A\bar{B}(C+BD) + \bar{A}\bar{B})C$

$= A\bar{B}CC + A\bar{B}\overset{0}{B}DC + \bar{A}\bar{B}C$

$= A\bar{B}C + \bar{A}\bar{B}C = \boxed{\bar{B}C}$

1(2). $F(A,B,C) = A\bar{B} + A(\overline{B+C}) + B(\bar{B}+\bar{C}) = A\bar{B} + A\bar{B}\bar{C} + B\overset{0}{\bar{B}}\bar{C} = A\bar{B} + A\bar{B}\bar{C} = \boxed{A\bar{B}}$

2(1). $F = A + \bar{B}C$ SOP Form: $F = \sum(1,4,5,6,7) =$

$\boxed{\bar{A}\bar{B}C + A\bar{B}\bar{C} + A\bar{B}C + AB\bar{C} + ABC}$

ABC	F
000	0
001	1
010	0
011	0
100	1
101	1
110	1
111	1

2(2). $F = A\bar{B} + B\bar{C} + \bar{A}C$

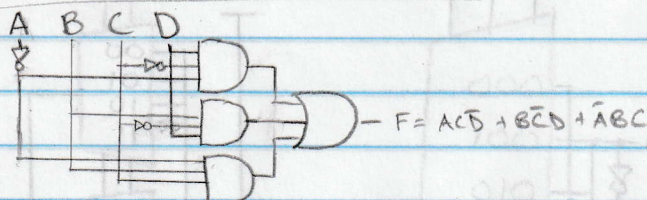| ABC	F
000	0
001	1
010	1
011	1
100	1
101	1
110	1
111	0

SOP Form: $F = \sum(1,2,3,4,5,6) =$

$\boxed{\bar{A}\bar{B}C + \bar{A}B\bar{C} + \bar{A}BC + A\bar{B}\bar{C} + A\bar{B}C + AB\bar{C}}$

3(1).

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

$F = \bar{A}\bar{C}D + \bar{B}\bar{C}D + \bar{A}BC$

$- F = A\bar{C}\bar{D} + \bar{B}\bar{C}D + \bar{A}BC$

3(2).

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

$F = \bar{A}\bar{B} + \bar{\bar{C}}\bar{D} + A\bar{B} + C\bar{D} = \boxed{\bar{B}+\bar{D}} =$

$F = \bar{B} + \bar{D}$

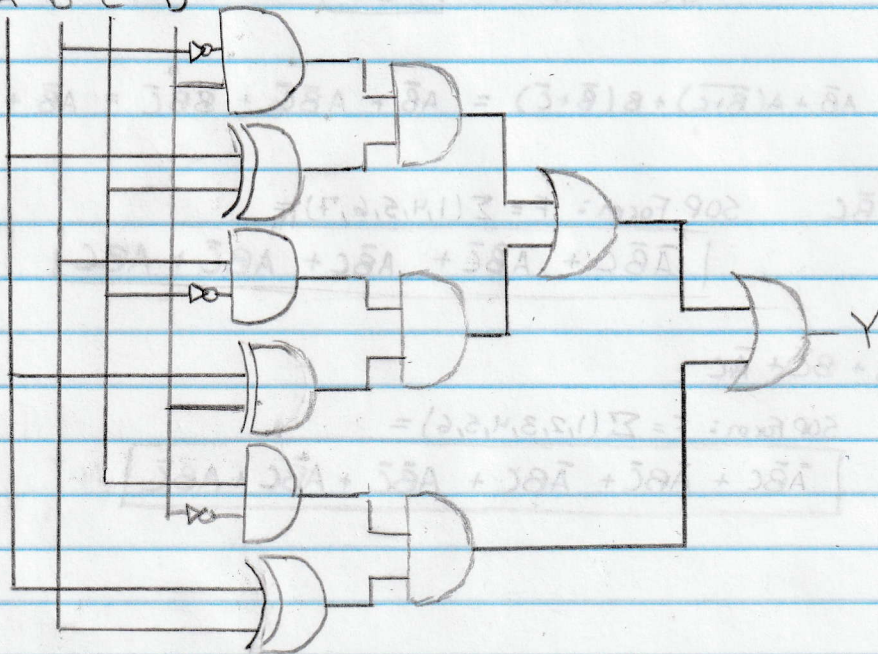| A	B	C	D	Y
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

4b. $Y(A,B,C,D) = \Sigma(3,5,6,9,10,12)$

$$= \bar{A}\bar{B}CD + \bar{A}B\bar{C}D + \bar{A}BC\bar{D} + A\bar{B}\bar{C}D + A\bar{B}C\bar{D} + AB\bar{C}\bar{D}$$
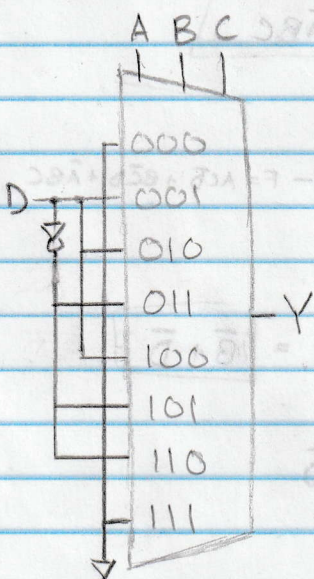
$$Y = \bar{B}D(A\oplus C) + B\bar{C}(A\oplus D) + C\bar{D}(A\oplus B)$$

4c1.

4c2.

4c3.