

2.11 (a) $F(A,B,C) = (A+B')C' + A'C$

A	B	C	A'	B'	C'	A+B'	A'C	F
0	0	0	1	1	1	1	0	1
1	0	0	0	1	1	1	0	1
2	0	1	0	1	0	0	0	0
3	0	1	1	0	1	1	1	1
4	1	0	0	1	1	1	0	1
5	1	0	1	0	1	1	1	1
6	1	1	0	0	0	0	0	0
7	1	1	1	0	0	1	1	1

$$F = \sum m(0,1,3,4,6)$$

(b) $F(X,Y,Z) = (X+Y')(X'+Z)(Z+Y')$

X	Y	Z	X'	Y'	X+Y'	X'+Z	Z+Y'	F
0	0	0	1	1	1	1	1	1
1	0	0	0	1	1	1	1	1
2	0	1	0	1	1	1	0	0
3	0	1	1	0	0	1	1	0
4	1	0	0	1	1	0	1	0
5	1	0	1	0	0	1	1	0
6	1	1	0	0	1	1	0	0
7	1	1	1	0	0	1	1	1

$$F = \sum m(0,1,5,7)$$

(c) $F(P,Q,R) = \sum m(2,3,4,6,7)$

(d) $F(A,B,C,D) = \sum m(0,4,5,6,8,11,12,13,14)$

(e) $F(W,X,Y,Z) = WZ' + (W'+X')YZ' + W'Z'X'$

W	X	Y	Z	W'	X'	Z'	W'+X'	(W'+X')YZ'	WZ'	W'Z'X'	F
0	0	0	0	1	1	1	1	0	0	1	1
1	0	0	1	1	1	0	1	0	0	0	0
2	0	1	0	1	1	1	1	1	0	0	1
3	0	1	1	1	1	0	1	0	0	0	0
4	1	0	0	0	1	1	0	0	1	0	1
5	1	0	1	0	1	0	0	0	0	0	0
6	1	1	0	0	0	1	0	0	1	0	1
7	1	1	1	0	0	0	0	0	0	0	0
8	0	0	0	1	1	1	1	0	0	1	1
9	0	0	1	1	1	0	1	0	0	0	0
10	0	1	0	1	1	1	1	1	0	0	1
11	0	1	1	1	1	0	1	0	0	0	0
12	1	0	0	0	1	1	0	0	1	0	1
13	1	0	1	0	1	0	0	0	0	0	0
14	1	1	0	0	0	1	0	0	0	0	0
15	1	1	1	0	0	0	0	0	0	0	0

$$F = \sum m(0,2,6,8,10,12,14)$$

(f) $F(A,B,C) = \sum m(0,1,2,3,4,5,6,7)$

(g) $F(A,B,C) = \text{no minterm}$

2.12 (a) $F(A,B,C) = (A+B') + C' + A'C$

A	B	C	A'	B'	C'	A+B'	A'C	F
0	0	0	1	1	1	1	0	1
1	0	0	0	1	1	1	0	1
2	0	1	0	1	0	1	1	1
3	0	1	1	0	1	0	0	0
4	1	0	0	1	1	1	0	1
5	1	0	1	0	1	1	1	1
6	1	1	0	0	0	1	0	1
7	1	1	1	0	0	1	1	1

F = No maxterm

(b) $F(X,Y,Z) = (X+Y')(X'+Z)+ZY'$

See the truth table of problem 2.10(2)
 $F = \prod M(2,3,4,6)$

(c) $F(P,Q,R,S) = (P+Q')R' + P'S'R' + PQ'(S'+R'+Q')$

P	Q	R	S	P'	Q'	R'	S'	(P+Q')R'	P'S'R'	PQ'(S'+R'+Q')	F
0	0	0	0	1	1	1	1	1	1	0	1
1	0	0	1	1	1	0	0	0	0	0	0
2	0	1	0	1	1	1	0	1	0	0	1
3	0	1	1	1	1	0	1	0	0	0	0
4	1	0	0	0	1	1	0	0	0	1	0
5	1	0	1	0	1	0	1	0	0	0	0
6	1	1	0	0	0	1	0	0	0	0	0
7	1	1	1	0	0	0	1	0	0	0	0
8	0	0	0	1	1	1	1	1	1	0	1
9	0	0	1	1	1	0	0	0	0	0	0
10	0	1	0	1	0	1	0	1	0	0	1
11	0	1	1	1	0	0	1	0	0	0	0
12	1	0	0	0	1	1	0	0	0	1	1
13	1	0	1	0	1	0	1	0	0	0	0
14	1	1	0	0	0	1	0	0	0	0	0
15	1	1	1	0	0	0	1	0	0	0	0

$$F = \prod M(2,3,5,6,7,14,15)$$

(d) $F(A,B,C,D) = \prod M(2,3,4,6,8,9,10,12,13)$

(e) $F(A,B,C) = \text{No maxterm}$

(f) $F(A,B,C) = \prod M(0,1,2,3,4,5,6,7)$

2.13 (a)

$XY' + X'Z + Y'Z = X'Y + X'Z$

See the truth table of problem 2.4(1)
 $\sum m(1,3,4,5)$ NOT EQUAL TO $\sum m(1,2,3)$
 \rightarrow False

(b) $(B'+C)(B'+D) = B'+CD$

See the truth table of problem 2.4(2)
 $\sum m(0,1,2,3,7) = \sum m(0,1,2,3,7)$
 \rightarrow True