

11.51

(a) $F = \bar{A}\bar{B}C + \bar{A}B\bar{C} + A\bar{B}\bar{C} + ABC$

$A \backslash BC$	00	01	11	10
0		1		1
1	1		1	

Since the Karnaugh map contains no pairs of adjacent 1's, F cannot be simplified.

(b) $F = \bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}B\bar{C} + A\bar{B}\bar{C} + ABC$

$A \backslash BC$	00	01	11	10
0	1	1		1
1		1	1	

$$F = \bar{A}\bar{B} + AC + \bar{A}\bar{C}$$

OR

$$F = \bar{B}C + AC + \bar{A}\bar{C}$$

$A \backslash BC$	00	01	11	10
0	1	1		1
1		1	1	

(c) $F = \bar{A}BC + A\bar{B}C + A\bar{B}\bar{C} + ABC$

$A \backslash BC$	00	01	11	10
0			1	
1		1	1	1

$$F = AC + AB + BC$$

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

$A \backslash BC$	00	01	11	10
0	1	1		1
1				1

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

11.53 (a)

A \ BC	00	01	11	10
0		1	1	1
1	1	1		

$$\underline{\underline{F = A\bar{B} + \bar{A}C + \bar{A}B}}$$

OR

A \ BC	00	01	11	10
0		1	1	1
1	1	1		

$$\underline{\underline{F = A\bar{B} + \bar{A}B + \bar{B}C}}$$

(b)

A \ BC	00	01	11	10
0				1
1	1		1	1

$$\underline{\underline{F = A\bar{C} + AB + B\bar{C}}}$$

(c)

A \ BC	00	01	11	10
0	1	1	1	1
1		1		1

$$\underline{\underline{\bar{F} = \bar{A} + \bar{B}C + B\bar{C}}}$$

11.57

(a)

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

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

(b)

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

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

(c)

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

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

III.58 (a)

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

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

(b)

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

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

(c)

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

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

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

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

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

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