

2.2

$$(e) (a + b + c')(a'b' + c) = aa'b' + ac + ba'b' + bc + c'a'b' + c'c = ac + bc + a'b'c'$$

$$(f) a'b'c + ab'c + abc + a'bc = b'c + bc = c$$

2.4

$$(d) (A' + C)(A' + C')(A + B + C'D) = (A' + CC')(A + B + C'D)$$

$$= A'(A + B + C'D) = AA' + A'B + A'C'D = A'(B + C'D)$$

$$(e) A'BD' + ABC'D' + ABCD' = BD'(A' + AC' + AC)$$

$$= BD'$$

2.9

$$(c) F' = [z + z'(v'w + xy)]' = z'[z'(v'w + xy)]'$$

$$= z'[z'v'w + xyz']' = z'[(z'v'w)'(xyz')']$$

$$= z'[(z + v + w') + (x' + y' + z)]$$

$$= z'z + z'v + z'w' + z'x' + z'y' + z'z$$

$$= z'(v + w' + x' + y')$$

2.11

$$(b) F = ac + bc' = abc + ab'c + abc' + a'bc'$$

$$F(a, b, c) = \Sigma(2, 5, 6, 7)$$

$$a \ b \ c \ F$$

$$0 \ 0 \ 0 \ 0$$

$$0 \ 0 \ 1 \ 0$$

$$0 \ 1 \ 0 \ 1$$

$$0 \ 1 \ 1 \ 0$$

$$1 \ 0 \ 0 \ 0$$

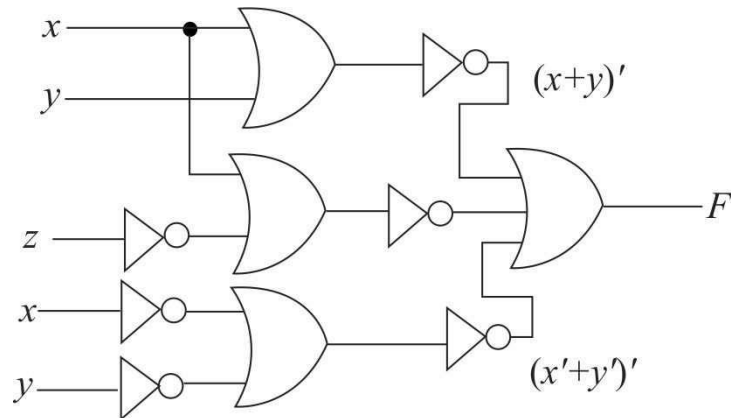
$$1 \ 0 \ 1 \ 1$$

$$1 \ 1 \ 0 \ 1$$

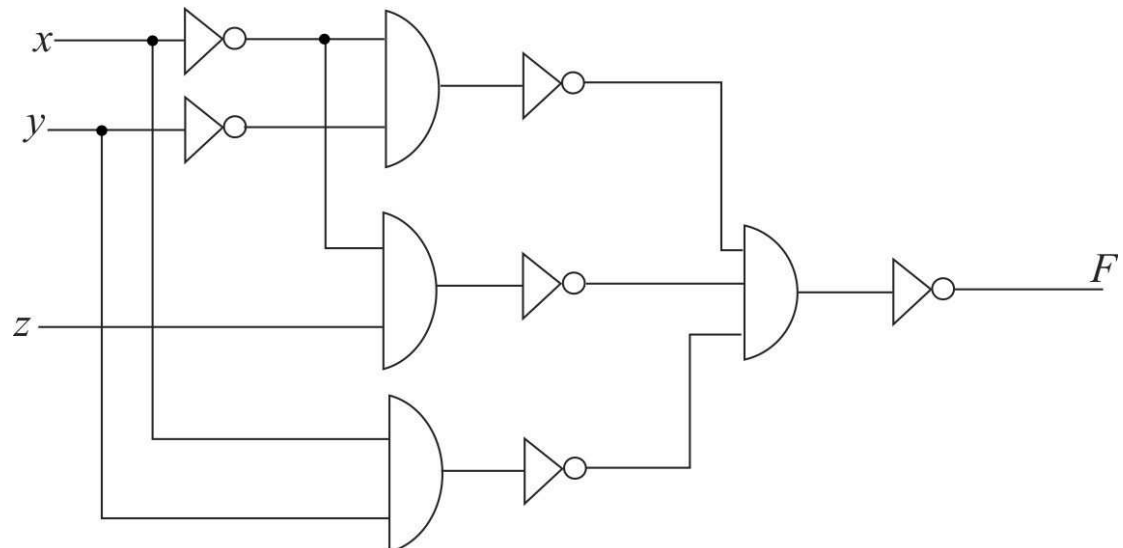
$$1 \ 1 \ 1 \ 1$$

2.14

(b) $F = x'y' + x'z + xy = (x+y)' + (x+z)' + (x'+y')'$



(c) $F = x'y' + x'z + xy = [(x'y')(x'z)(xy)]'$



2.22

(b) $x' + z(x+y')(y+z') = x' + (xz + zy')(y+z') = x' + xyz$

$= x' + yz \rightarrow \text{SOP form}$

$= (x' + y)(x' + z) \rightarrow \text{POS form}$

2.28 (a) $y = a(bcd)'e = a(b' + c' + d')e$

$$y = a(b' + c' + d')e = ab' + ac' + ad'$$

$$= \Sigma(17, 19, 21, 23, 25, 27, 29)$$

a bcde	y	a bcde	y
0 0000	0	1 0000	0
0 0001	0	1 0001	1
0 0010	0	1 0010	0
0 0011	0	1 0011	1
0 0100	0	1 0100	0
0 0101	0	1 0101	1
0 0110	0	1 0110	0
0 0111	0	1 0111	1
0 1000	0	1 1000	0
0 1001	0	1 1001	1
0 1010	0	1 1010	0
0 1011	0	1 1011	1
0 1100	0	1 1100	0
0 1101	0	1 1101	1
0 1110	0	1 1110	0
0 1111	0	1 1111	0

(b) $y_1 = a \oplus (c + d + e) = a'(c + d + e) + a(c'd'e') = a'c + a'd + a'e + ac'd'e'$

$$y_2 = b'(c + d + e)f = b'cf + b'df + b'ef$$

$$y_1 = a(c + d + e) = a'(c + d + e) + a(c'd'e') = a'c + a'd + a'e + ac'd'e'$$

$$y_2 = b'(c + d + e)f = b'cf + b'df + b'ef$$

$a'-c---$	$a'--d--$	$a'---e-$	$a-c'd'e'-$		
001000 = 8	000100 = 8	000010 = 2	100000 = 32		
001001 = 9	000101 = 9	000011 = 3	100001 = 33		
001010 = 10	000110 = 10	000110 = 6	110000 = 34		
001011 = 11	000111 = 11	000111 = 7	110001 = 35		
001100 = 12	001100 = 12	001010 = 10			
001101 = 13	001101 = 13	001011 = 11			
001110 = 14	001110 = 14	001110 = 14			
001111 = 15	001111 = 15	001111 = 15			
011000 = 24	010100 = 20	010010 = 18	001001 = 9	001001 = 9	000011 = 3
011001 = 25	010101 = 21	010011 = 19	001011 = 11	001011 = 11	000111 = 7
011010 = 26	010110 = 22	010110 = 22	001101 = 13	001101 = 13	001011 = 11
011011 = 27	010111 = 23	010111 = 23	001111 = 15	001111 = 15	001111 = 15
			101001 = 41	101001 = 41	100011 = 35
			101011 = 43	101011 = 43	100111 = 39
			101101 = 45	101101 = 45	101011 = 51
			101111 = 47	101111 = 47	101111 = 55
011100 = 28	011100 = 28	011010 = 26			
011101 = 29	011101 = 29	011001 = 27			
011110 = 30	011110 = 30	011110 = 30			
011111 = 31	011111 = 31	011111 = 31			

$y_1 = \Sigma (2, 3, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35)$

$y_2 = \Sigma (3, 7, 9, 13, 15, 35, 39, 41, 43, 45, 47, 51, 55)$

<i>ab cdef</i>	$y_1 \ y_2$	<i>ab cdef</i>	$y_1 \ y_2$	<i>ab cdef</i>	$y_1 \ y_2$	<i>ab cdef</i>	$y_1 \ y_2$
00 0000	0 0	01 0000	0 0	10 0000	1 0	11 0000	0 0
00 0001	0 0	01 0001	0 0	10 0001	1 0	11 0001	0 0
00 0010	1 0	01 0010	1 0	10 0010	1 0	11 0010	0 0
00 0011	1 1	01 0011	1 0	10 0011	1 1	11 0011	0 1
00 0100	0 0	01 0100	0 0	10 0100	0 0	11 0100	0 0
00 0101	0 0	01 0101	0 0	10 0101	0 0	11 0101	0 0
00 0110	1 0	01 0110	1 0	10 0110	0 0	11 0110	0 0
00 0111	1 1	01 0111	1 0	10 0111	0 1	11 0111	0 1
00 1000	1 0	01 1000	1 0	10 1000	0 0	11 1000	0 0
00 1001	1 1	01 1001	1 0	10 1001	0 1	11 1001	0 0
00 1010	1 0	01 1010	1 0	10 1010	0 0	11 1010	0 0
00 1011	1 0	01 1011	1 0	10 1011	0 1	11 1011	0 0
00 1100	1 0	01 1100	1 0	10 1100	0 0	11 1100	0 0
00 1101	1 1	01 1101	1 0	10 1101	0 1	11 1101	0 0
00 1110	1 0	01 1110	1 0	10 1110	0 0	11 1110	0 0
00 1111	1 1	01 1111	1 0	10 1111	0 1	11 1111	0 0