

(a, b, d) same as before! (c) no.

3-3) (c)  $k' \lambda m' + k' m' n + k \lambda m' n' + \lambda m n'$   
 $= k' \lambda m' (n+n') + k' m' n (\lambda+\lambda') + k \lambda m' n' + \lambda m n' (k+k')$   
 $= k' \lambda m' n + k' \lambda m' n' + k' m' \lambda n + k' m' \lambda' n + k \lambda m' n' +$   
 $k \lambda m n' + k' \lambda m n'$

$\lambda \backslash m$	00	01	12	10
00		1		
01	1	1		1
12	1			1
10				

$$F = k' m' n + \lambda n' + k' \lambda m'$$

1	1	1	1
1			

$$\lambda + n = 1$$

## Ch-3

3-1. 1 (b)  $F(A,B,C,D) = \Sigma(5,13,25,27)$

<del>AB</del> <del>CD</del>	00	01	11	10
00				
01				
11	1	1	1	
10				

$$F = B'C'D + ABD + AB'C' \quad \text{by}$$

(2) (a, c, d) same as before (b) no --

3) 3-2) (c)  $a'b' + be + d'be'$

$$= d'b'(e+e') + abe(a+a') + a'be'$$

$$= a'b'e + a'b'e' + abe + a'be + a'be'$$

<del>AB</del> <del>CD</del>	00	01	11	10
0	1	1	1	1
1			1	

$$F = a' + be \quad \text{by}$$

$\Sigma - N$

(a, b, d) same as before (c) no -

3-3] (c)  $k'lm' + k'm'n + klm'n' + lmn'$

$$= k'lm'(n+n') + k'm'n(l+l') + klm'n' + lmn'(k+k')$$

$$= k'lm'n + k'lm'n' + klm'n + k'm'l'n + klm'n' + klmn' + k'lmn'$$

		mn	00	01	11	10
kl	00		1			
	01	1	1		1	
11	1			1		
10						

$$F = k'm'n + lm'n' + \cancel{k'lm'}$$

$$(d) A'D'e'd' + A'e'd' + B'e'd' + A'BCD + BC'd'$$

$$= A'D'e'd' + A'e'd'(B+B') + B'e'd'(A+A') + A'BCD +$$

$$BC'd'(A+A')$$

$$= A'B'e'd' + AB'e'd' + AB'e'd' + A'e'd' + A'e'd'$$

$$+ A'BCD + ABC'e'd' + A'BC'd'$$

$AQ \backslash EP$	00	01	11	10
00	1			1
01		1	1	
11	1	1		
10	1	0		1

$$F = D'e'd' + A'e'd + ABC'e'$$

(a, b, c) same as before  $b \oplus (e, d)$  no -

$$(3-5) (a) F_1 = \prod (0, 3, 5, 6)$$

$$= (n+y+z) (n+y'+z') (n'+y+z')$$

$$(n'+y'+z)$$

$$= M_0 M_3 M_5 M_6$$

$$F_2 = \prod (0, 1, 2, 9) \quad \cancel{M_2}$$

$$= (n+y+z) (n+y+z') (n+y'+z) (n'+y+z)$$

$$= M_0 M_1 M_2 M_9$$

$$(b) F_1 = \sum (1, 2, 4, 7)$$

$$F_1 = n'y'z + ny'z' + ny'z' + nyz$$

$n \backslash yz$	00	01	11	10
0	0	1	1	1
1	1	1	1	1

3

$$F_2 = \sum (3, 5, 6, 7)$$

$n \setminus y^2$	00	01	11	10
0	1		1	
1		1	1	1

$$F = y^2 + n^2 + ny \quad \cancel{\text{POS}}$$

(e) From (b) we get

$$F_{1P} = \sum F_1 = \text{IT}(0, 3, 5, 6) \quad \text{POS}$$

$n \setminus y^2 + z^2$	00	01	11	10
0	0	0	0	0
1	0	0	0	0

$$F = (n'y + z) (n'y' + z') * (n'y + z')$$

$$F_2 \subseteq \text{IT}(0, 1, 2, 4) + \text{POS}$$

$n \setminus y^2$	00	01	11	10
0	0	0		0
1	0			

$$F = \frac{n'y' + ny + yz'}{(n+y)(n+z)} \quad \cancel{\text{POS}}$$

$$3-6(b) F(A, B, C, D) = \pi(0, 1; 2, 3, 4, 10, 11)$$

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

$$\begin{aligned} F &= \cancel{A'c'd'} + \cancel{A'c'} + \cancel{d'c} \\ &= (A+c+d)(A+c+d)(A+b)(B+c') \end{aligned}$$

(a, c) same as before (b) no. -

$$(3-7)(a) n'z' + y'z' + yz' + nyz$$

$$= n'z'(y+y') + y'z'(n+n') + (n+n')yz' + nyz$$

$$= n^2yz' + n^2y^2z' + ny^3z' + n^2y^2z' + ny^2z' + ny^2z'$$

$$+ ny^5z$$

$$= n'y^2z' + n'y^2z' + ny^2z' + ny^2z' + ny^2z$$

(1) SOP  $\rightarrow 1$

$w$	00	01	11	10
0	1			1
1	1	1	1	1

$$y = z' + ny \quad E$$

pos  $\longrightarrow 0$

$w$	10	01	11	10
0	0	0		
1	0	1		

$$\begin{aligned} F &= \overline{a'b'd} (e' + z) (y' + z') \\ &= (y + z') (y + z') \quad E \end{aligned}$$

$$\begin{aligned} b) (A + B' + D) (A' + B + D) (C + D) (C + D') \\ &= (A + B' + D + CD) (A' + B + C + D) \\ &= (A + B' + D + CD) (A' + B + C + D) (C + D + AA') \\ A + B' + D + CD &= (A + B' + C + D) (A + B' + C' + D) \\ A' + B + C + D &= (A + B + C + D) (A' + B + C' + D) \\ (C + D + AA' + CC') &= A + C + D \end{aligned}$$

$$(b) (A+B'+D) (A'+B+D) (C+D) (C'+D')$$

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

1st term -

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

2nd term -

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

3rd term -

$$(A+C+D) (A'+C+D) \cancel{= A+}$$

$$= (A+C+D+BB') (A'+C+D+BB')$$

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

4th term -

$$(A+C'+D') (A'+C'+D')$$

$$= (A+C'+D'+BB') (A'+C'+D'+BB')$$

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

Combining all terms and removing those that appear more than once -

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

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

(2) POS  $\rightarrow$  e

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

$$F = (e+d)(e'+d')(A+B'+D)(A'+B+D)$$

① S O P  $\rightarrow$

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

$$F = e'D + A'B'e'D' + ABCD'$$

Ans

(c, d, e) same as before -

$$3-15] (b) F = B'C'D' + BC'D' + ABCD$$

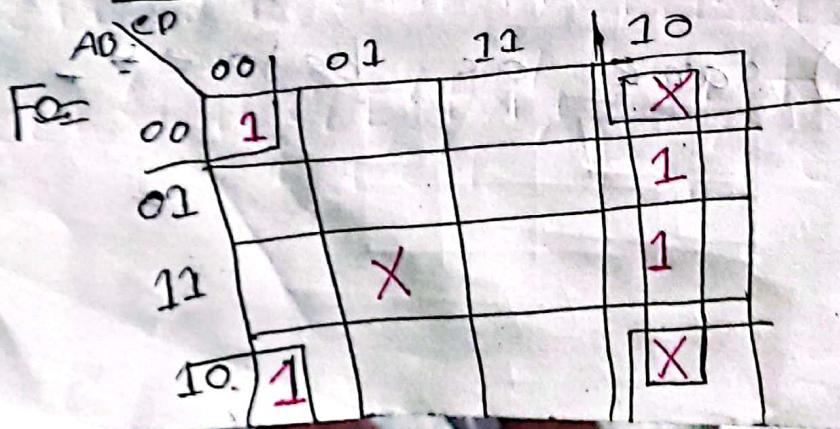
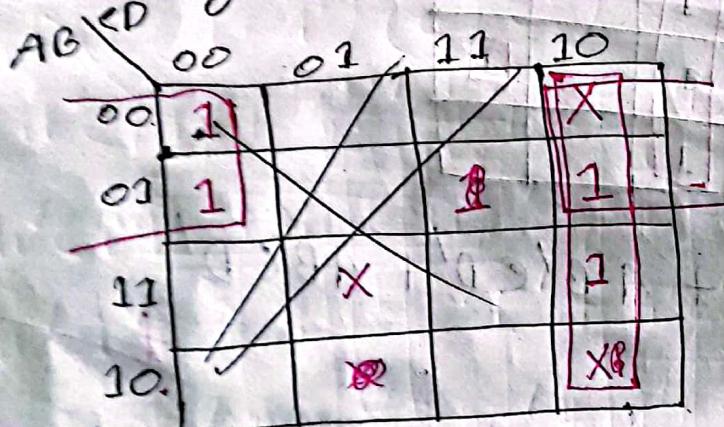
$$d = B'C'D' + ABC'D'$$

$$\begin{aligned} F &= B'C'D'(A+A') + BC'D'(A+A') + ABCD' \\ &= AB'C'D' + A'B'C'D' + ABCD' + A'BCD' + ABCD' \end{aligned}$$

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

$$= AB'C'D' + A'B'C'D' + ABC'D'$$

Combining 1's and X's



$$F = B'D' + CD'$$

(a) same as before -

$$\text{3-16} | (a) F = A'B'D' + A'CD + ABC$$

$$= A'B'D(C + C') + A'CD(B + B') + A'BCD(D + D')$$

$$= A'BCD + A'BC'D' + A'CD + A'BCD + ABCD + A'BCD'$$

$$d = A'BCD + A'CD + AB'D'$$

$$= A'BCD + ACD(B + B') + AB'D'(C + C')$$

$$= A'BCD + ACD + AB'D' + A'BCD'$$

$$= A'BCD + A'BCD + AB'D + A'BCD$$

	AB'CD			
AB	00	01	10	11
CD	00	1	1	1
01	X	1	1	
10		X		
11			X	X

	00	01	11	10
CD	00	0		
01	0	X		
11	0	0	X	0
10	X	0	X	X

$F = \overline{CD} \oplus \overline{B} \overline{A}$  Sum of Product

$$F = B'D + A'C$$

2) POS

$$F = \cancel{cD'} + \cancel{A'D'} + \cancel{D'e} \\ = (c+d') (A'+d') (B'+e)$$

(b, e) same as before.

$$\begin{aligned} 3-4) (c) A'B'C'E' + A'B'C'D' + B'D'E' + B'C'D' + \\ & CDE' + CDE \\ & = A'B'C'E'(D+D') + A'B'C'D'(E+E') + B'D'E'(A+A')(E+E') \\ & + B'C'D'(A+A')(E+E') + CDE'(A+A')(D+B') + \\ & BDE'(A+A')(C+C') \\ & = A'B'CDE' + A'B'C'D'E' + A'B'C'D'E + A'B'C'D'E' + \\ & ABCD'E' + AB'C'D'E' + A'B'C'D'E' + A'B'C'D'E' + \\ & AB'C'D'E' + AB'C'D'E' + A'B'C'D'E + A'B'C'D'E' + \\ & ABCDE' + AB'CDE' + A'B'CDE' + A'B'CDE' + \\ & ABCDE' + AB'CDE' + A'B'CDE' + A'B'CDE' \end{aligned}$$

DE		00	01	11	10	00	01	11	10
BC		00	1	1		1	1	1	1
		00	1	1		1	1	1	1
		00							
		01							
		11							
		10							

$$A = 1$$

$$F = C'DE' + C'DE + B'C'D'E' + B'C'D'E + A'B'C'D'E'$$

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(b)  $F(A, B, C, D, E) = \sum(0, 1, 4, 5, 16, 17, 21, 25, 29)$

DE		00	01	11	10	00	01	11	10
BC		00	1	1		1	1	1	1
		00	1	1		1	1	1	1
		00							
		01							
		11							
		10							

$$A = 01$$

$$A = 2$$

$$F = B'C'D'E' + A'C'D'E + A'D'E$$

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$$\begin{aligned}
 & \text{(b)} BDE + B'C'D + CDE + A'B'C'E + A'B'C + B'C'D'E' \\
 &= BDE(A+A') (C+C') + B'C'D(A+A')(E+E') + CDE(A+A')(B+B') \\
 &+ A'B'C'E(D+D') + A'B'C(D+D')(E+E') + B'C'D'E'(A+A') \\
 &= ABCDE + ABC'DE + A'B'CDE + A'B'C'DE + \\
 & AB'C'DE + AB'C'D'E' + A'B'C'DE + A'B'C'D'E' + \\
 & ABCDE + ABC'DE + A'B'CDE + A'B'C'DE + \\
 & A'B'CDE + A'B'C'D'E + A'B'C'DE + A'B'C'D'E' + \\
 & A'B'C'D'E + A'B'C'D'E' + ABC'C'D'E' + A'B'C'D'E'
 \end{aligned}$$

$B'C'DE$

	00	01	11	10
00	1			1
01	1	1	1	1
11			1	
10			1	

$$A = 0$$

	00	01	11	10
00	1		1	1
01			1	
11			1	
10			1	

$$A = 1$$

$$F = DE + B'C'E + A'B'C$$

A<sub>2</sub>