1)

a) $F(ABCD) = (5, 7, 8, 9, 12, 13, 15)$
$d(4)$

Termos	ABCD	
4	0100	V
8	1000	V
5	0101	V
9	1001	V
12	1100	V
7	0111	V
13	1101	V
15	1111	V

Termos	ABCD	
4, 5	010-	V
4, 12	-100	V
5, 7	01-1	V
8, 9	100-	V
8, 12	1-00	V
5, 13	-101	P_0
9, 13	1-01	P_1
12, 13	110-	P_2
7, 15	-111	V
13, 15	11-1	P_3

Termos	ABCD	
4,5; 12,13	-10-	P_4
5,7; 13,15	-1-1	P_5
8,9; 13,12	1-0-	P_6

	5	7	8	9	12	13	15
P_0			X		X		
P_1	X					X	
P_2				X		X	
P_3		X					X
P_4	X				X	X	
P_5		X				X	X
P_6	X	X	X	X	X		

P_6

→ P_6 é essencial

$F(ABCD) = P_6 + P_5$

$AC' + BD$

	5	7	15
P_0			
P_1	X		
P_2		X	X
P_3	X		
P_4	X	X	X
P_5			
P_6			

P_5

1)

b)

$f(A,B,C,D) = \Sigma m(0,1,2,3,4,5,15)$

$d(10,14)$

0000 → 0

0001 → 1

0011 → 3

0101 → 5

0010 → 2

0100 → 4

1111 → 15

1010 → 10

1110 → 14

Termos	A	B	C	D	
0	0	0	0	0	V
1	0	0	0	1	V
2	0	0	1	0	V
4	0	1	0	0	V
3	0	0	1	1	V
5	0	1	0	1	V
10	1	0	1	0	V
14	1	1	1	0	V
15	1	1	1	1	V

Termos	A B C D	
0,1	0 0 0 -	V
0,2	0 0 - 0	V
0,4	0 - 0 0	V
1,3	0 0 - 1	V
1,5	0 - 0 1	V
2,3	0 0 1 -	V
2,10	- 0 1 0	P_0
4,5	0 1 0 -	V
10;14	1 - 1 0	
14,15	1 1 1 -	F_1

Don't care não entra na 2ª fase

Termos		
0,1;2,3	0 0 - -	P_2
0,1;4,5	0 - 0 -	P_3
0,2;1,3	0 0 - -	P_4
0,4;1,5	0 - 0 -	P_5

$P_3 = P_5$

$P_4 = P_2$

P_0

	4	5	15	
P_0				
P_1				P_1
P_2				
P_3	X	X		P_3
P_4	X	X		

	0	1	2	3	4	5	15
P_0			X				X
P_1							
P_2	X	X	X	X			
P_3	X	X			X	X	
P_4	X	X	X	X			
P_5	X	X			X	X	

→ escolhendo P_2 como essencial

→ eliminando os colunas

$f(A,B,C,D) = P_1 + P_2 + P_3$

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

1)

c) $F(A,B,C,D) = \Sigma m(1, 9, 11, 13, 15)$

$d(0,4,5)$

0000 → 0100 → 0101

1001 → 1011 → 1111

Termos	A	B	C	D	
0	0	0	0	0	V
1	0	0	0	1	V
4	0	1	0	0	V
5	0	1	0	1	V
9	1	0	0	1	V
11	1	0	1	1	V
13	1	1	0	1	V
15	1	1	1	1	V

Termos	A	B	C	D	
0,1	0	0	0	–	V
0,4	0	–	0	0	V
1,5	0	–	0	1	V
1,9	–	0	0	1	
4,5	0	1	0	–	V
9,11	1	0	–	1	V
9,13	1	–	0	1	V
11,15	1	–	1	1	P_1
13,15	1	1	–	1	V

Termos	A	B	C	D	
0,1 ; 4,5	0	–	0	–	P_2
0,4 ; 1,5	0	–	0	–	P_3
1,5 ; 9,13	–	–	0	1	P_4
9,11 ; 13,15	1	–	–	1	P_5

$P_2 = P_3$

	1	9
P_1		
P_2	X	
P_3	X	
P_4	X	
P_5		

P_3

	1	9	11	13	15
P_1			X		X
P_2	X				
P_3	X				
P_4	X	X	X	X	X
P_5		X			

→ P_5 é essencial
e eliminar colunas

$F(ABCD) = P_3 + P_5$

$A'C' + AD$