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Ferza Reyaldi

3 TI REGULER A

UTS STRUKTUR DISKRIT II.

(1.) a. $F(x,y) = \bar{x} + y$

$= \bar{x}(y+\bar{y}) + y(\bar{x}+x)$

$= \bar{x}y + \bar{x}\bar{y} + \bar{x}y + xy$

$= \bar{x}y + \bar{x}\bar{y} + xy.$

b. $F(x,y) = 1$

$= (x+\bar{x}).(y+\bar{y})$

$= xy + x\bar{y} + \bar{x}y + \bar{x}\bar{y}$

c. $F(x,y) = x\bar{y}$ (sudah dalam bentuk kanonik SOP)

d. $F(x,y) = \bar{y}$

$= \bar{y}(x+\bar{x})$

$= \bar{x}\bar{y} + x\bar{y}.$

(2) a.

wx \ yz	00	01	11	10
00	0	1	0	1
01	0	1	0	0
11	0	1	0	1
10	0	0	1	0

$F(w,x,y,z) = w'y'z + xy'z + wx'yz + w'x'yz' + wxyz'$

b.

wx \ yz	00	01	11	10
00			1	1
01		1		
11	1		1	1
10	1	1	1	

$F(w,x,y,z) = wy'z' + wx'z + wxy + w'x'y + w'xy'z.$

(3) $A = \{a,b,c,d,e\}$

Banyak himpunan bagian $= \sum_{i=0}^{5} C(5,i) = C_0^5 + C_1^5 + C_2^5 + C_3^5 + C_4^5 + C_5^5$

$= \frac{5!}{0!5!} + \frac{5!}{1!4!} + \frac{5!}{2!3!} + \frac{5!}{3!2!} + \frac{5!}{4!1!} + \frac{5!}{5!0!}$

$= 1 + 5 + 10 + 10 + 5 + 1.$

$= 32 //$

④ Suku ke-empat dari $(5-4x)^6$.

$r = 4-1 = 3$.

Suku ke-empat $= C_3^6 (5)^{6-3} (-4x)^3$

$= \frac{6!}{3!3!} \cdot 5^3 \cdot (-4x)^3$

$= 20\,(125)(-64x^3)$

$= -160.000\,x^3$.

⑤. $f(w,x,y,z) = \Sigma(0,1,3,4,5,6,7,9,11,12,13,14)$

term	String	
0	0000	✓
1	0001	✓
4	0100	✓
3	0011	✓
5	0101	✓
6	0110	✓
9	1001	✓
12	1100	✓
7	0111	✓
11	1011	✓
13	1101	✓
14	1110	✓

term	String	
0,1	000-	✓
0,4	0-00	✓
1,3	00-1	✓
1,5	0-01	✓
1,9	-001	✓
4,5	010-	✓
4,6	01-0	✓
4,12	-100	✓
3,7	0-11	✓
3,11	-011	✓
5,7	01-1	✓
5,13	-101	✓
6,7	011-	✓
6,14	-110	✓
9,11	10-1	✓
9,13	1-01	✓
12,13	110-	✓
12,14	11-0	✓

term	String
0,1,4,5	0-0-
1,3,5,7	0--1
1,3,9,11	-0-1
1,5,9,13	--01
4,5,6,7	01--
4,5,12,13	-10-
4,6,12,14	-1-0

Prime Implicant	0	1	3	4	5	6	7	9	11	12	13	14
✓ 0,1,4,5	×	×		×	×							
1,3,5,7		×	×		×		×					
✓ 1,3,9,11		×	×					×	×			
1,5,9,13		×			×			×			×	
4,5,6,7				×	×	×	×					
4,5,12,13				×	×					×	×	
✓ 4,6,12,14				×		×				×		×
	* ✓	✓	✓	✓	✓	✓		✓	* ✓	✓		* ✓

sampai tahap ini masih ada 2 minterm yang belum tercakup dalam prime implicant terpilih, yaitu 7 dan 13. Bentuk prima yang tersisa (1,3,5,7), (1,5,9,13), (9,5,6,7), (9,9,12,13).
Kemungkinan jawaban :

- memilih (1,3,5,7) dan (1,5,9,13)
- memilih (1,3,5,7) dan (9,5,12,13)
- memilih (4,5,6,7) dan (1,5,9,13)
- memilih (4,5,6,7) dan (4,5,12,13).

Jadi $F(w,x,y,z) = w'y' + x'z + xz' + w'z + y'z$
$= w'y' + x'z + xz' + w'z + xy'$
$= w'y' + x'z + xz' + w'x + y'z$
$= w'y' + x'z + xz' + w'x + xy'$.