

DDAK - Clement Samuel Marly

$$1 \ a \ (A' + B) + BCD + (A + B + C')$$

Bentuk dual = + jadi. dan sebaliknya (or jadi and)

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

$$b \ (BC)(B+A')(B'+CD)$$

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

$$2 \ a \ F_{a,b,c} = ABC' + AB'C' + ABC$$

$$= ABC' + ABC' + AB'C' + ABC \quad \text{Idempotent law}$$

$$= AC'(B+B') + ABC' + ABC \quad \text{Distributive law}$$

$$= AC'(1) + ABC' + ABC \quad \text{Identity law dan Complement law}$$

$$= AC' + AB(C'+C) \quad \text{Distributive law}$$

$$= AC' + AB \quad \text{Identity law dan Complement law}$$

$$= A(C'+B) \quad \text{Distributive law}$$

$$b \ F_{A,B,C,D} = \Pi M(0, 1, 4, 5, 6, 7)$$

$$\text{maxterm} = M_0, M_1, M_4, M_5, M_6, M_7$$

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

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

Distributive law

$$= (A+B+C+0)(A+B'+C+0)(A+B'+C'+0) \quad \text{Complement law dan Associative law}$$

$$= (A+B+C)(A+B'+C)(A+B'+C') \quad \text{Identity law}$$

$$= (A+B+C)(A+B'+C)(A+B'+C) \quad \text{Idempotent law}$$

$$= ((A+B') + (C \cdot C'))((A+C) + (B'B)) \quad \text{Distributive law}$$

$$= (A+B'+0)(A+C+0) \quad \text{Complement dan Associative law}$$

$$\text{POS} = (A+B')(A+C) \quad \text{Identity law}$$

$$\text{SOP} = A + B'C \quad \text{Distributive law}$$

$$3 \quad a \quad F_{(A,B,C,D)} = \frac{BD'}{1} + \frac{ACD'}{2} + \frac{AB'C}{3} + \frac{A'C'}{4}$$

$$1 = BD' (A + A')$$

$$= ABD' + A'BD'$$

$$= ABD'(C + C') + A'BD'(C + C')$$

$$= \underset{m_{14}}{ABCD'} + \underset{m_{12}}{ABC'D'} + \underset{m_6}{A'BCD'} + \underset{m_4}{A'BC'D'}$$

$$2 = ACD' (B + B')$$

$$= \underset{m_{14}}{ABCD'} + \underset{m_{10}}{AB'C'D'}$$

$$3 = AB'C (D + D')$$

$$= \underset{m_{11}}{AB'CD} + \underset{m_{10}}{AB'C'D'}$$

$$4 = A'C' (B + B')$$

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

$$= \underset{m_5}{A'BC'D} + \underset{m_4}{A'BC'D'} + \underset{m_1}{A'B'C'D} + \underset{m_0}{A'B'C'D'}$$

$$SOP = m_0, m_1, m_4, m_5, m_6, m_{10}, m_{11}, m_{12}, m_{14}$$

$$= \Sigma (0, 1, 4, 5, 6, 10, 11, 12, 14)_{10}$$

$$= A'B'C'D' + A'B'C'D + A'BC'D' + A'BC'D + A'BCD' + AB'C'D' + AB'CD + ABC'D' + ABCD'$$

$$POS = M_2, M_3, M_7, M_8, M_9, M_{13}, M_{15}$$

$$= \Pi (2, 3, 7, 8, 9, 13, 15)_{10}$$

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

$$b) F_{a,b,c,d} = \underbrace{(A+C'D)}_1 \underbrace{(A'+B+C)}_2 \underbrace{(A+B')}_3$$

$$1 = A+C'D+(B'B)$$

$$= (A+B+C'D)(A+B'+C'+D) \rightarrow M_2, M_6$$

$$2 = A'+B+C+(D'D)$$

$$= (A'+B+C+D)(A'+B+C+D') \rightarrow M_8, M_9$$

$$3 = A+B'(C C')$$

$$= (A+B'+C+CD')(A+B'+C'+DD')$$

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

$$= M_4, M_5, M_6, M_7$$

$$POS = M_2, M_4, M_5, M_6, M_7, M_8, M_9$$

$$= \prod (2, 4, 5, 6, 7, 8, 9),,$$

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

$$SOP = m_0, m_1, m_3, m_{10}, m_{11}, m_{12}, m_{13}, m_{14}, m_{15}$$

$$= \sum (0, 1, 3, 10, 11, 12, 13, 14, 15),,$$

$$= A'B'C'D + A'B'C'D + A'B'CD + AB'CD' + AB'CD + ABC'D' + ABC'D + ABCD' + ABCD,$$

$$4) a) F_{a,b,c} = \sum (2, 4, 5, 6)$$

		B	C
A	A'B'C' 0	A'BC' 2	A'B'C 1
	AB'C' 4	ABC' 6	AB'C 5

	C'	C'	C	C
	B'	B	B	B'
A'	0	1	0	0
A	1	1	0	1

(ambil 0 karena POS)

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



b $F_{a,b,c,d} = \Sigma (0, 1, 2, 3, 9, 10, 12, 13)$

		00	01	11	10
	00	1	1	1	1
B	01	0	0	0	0
A	11	1	1	0	0
	10	0	0	0	0

$\bullet = (A+B')$ $\times = (A'+B+C+D)$

$\circ = (A'+C'+D')$ $\square = (B'+C')$

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

> sudah paling sederhana

5 a $F_{A,B,C} = \Pi (1, 3, 5, 6)$

$= \Sigma (0, 2, 4, 7)$

		$A'B'$	$A'B$	AB'	AB
A'	1	0	1	0	0
A	1	0	0	1	0

$\bullet = A'C'$ $\square = B'C'$ $\times = ABC$

SOP = $A'C' + B'C' + ABC$ „

b $F_{A,B,C,D} = \Pi (2, 6, 7, 8, 9, 13, 14, 15)$

$= \Sigma (0, 1, 3, 4, 5, 10, 11, 12)$

		00	01	11	10
	00	0	0	0	0
B	01	0	0	0	0
A	11	0	0	0	0
	10	0	0	0	0

$\bullet = A'C'$ $\times = AB'C$ $\square = B'DC$

$\bullet = B'D'C'$

SOP = $AB'C + B'DC + B'D'C' + A'C'$ „