TUGAS MANDIRI 3
PSD - C

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2 2 0 6 0 2 8 9 3 2

1. (a) $\bar{A}CD + A(CD + B) + \bar{B}C\bar{D}$

$\equiv \bar{A}CD + ACD + AB + \bar{B}C\bar{D}$ (distributif)
$\equiv (\bar{A} + A)CD + AB + \bar{B}C\bar{D}$ (distributif)
$\equiv 1.CD + AB + \bar{B}C\bar{D}$ (idempoten)
$\equiv CD + AB + \bar{B}C\bar{D}$ (identitas)
$\equiv CD + \bar{B}C\bar{D} + AB$ (komutatif)
$\equiv C(D + \bar{B}\bar{D}) + AB$ (distributif)
$\equiv C(D + \bar{B}) + AB$ (Absorpsi)

Sebelum Optimasi : L = 10, G = 15, GN = 18
Setelah Optimasi : L = 5, G = 8, GN = 9

(b) $(\bar{B} + \bar{C})(\bar{B} + D) + ACD$

$\equiv \bar{B}\bar{B} + \bar{B}\bar{C} + \bar{B}D + \bar{C}D + ACD$ (distributif)
$\equiv \bar{B} + \bar{B}\bar{C} + \bar{B}D + \bar{C}D + ACD$ (idempoten)
$\equiv \bar{B} + \bar{B}D + \bar{C}D + ACD$ (absorbsion)
$\equiv \bar{B} + \bar{C}D + ACD$ (absorpsion)
$\equiv \bar{B} + D(\bar{C} + AC)$ (distributif)
$\equiv \bar{B} + D(\bar{C} + A)$ (absorbsi)

Sebelum Optimasi : L = 7, G = 11, GN = 14
Setelah Optimasi : L = 4, G = 6, GN = 8

(c) $C\bar{D}(A+B) + \bar{C} + D$

misal $F_1 = C\bar{D}$, $\bar{F_1} = (\bar{C} + D)$

$F_1(A+B) + \bar{F_1}$
$\equiv A + B + \bar{C} + D$ (absorpsi)

Sebelum Optimasi : L = 6, G = 9, GN = 10
Setelah Optimasi : L = 4, G = 4, GN = 5

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2. a. SOP

	$\bar{C}$		C		
$\bar{A}$	1	0	0	1	$\bar{B}$
	1	1	0	1	B
A	1	1	1	1	
	0	0	0	1	$\bar{B}$
	$\bar{D}$	D		$\bar{D}$	

$F = AB + C\bar{D} + B\bar{C} + \bar{A}\,\bar{D}$

POS

	C		$\bar{C}$		
A	1	0	0	1	B
	1	1	0	1	$\bar{B}$
$\bar{A}$	1	1	1	1	
	0	0	0	1	B
	D		$\bar{D}$	D	

$F = (B + \bar{D})(A + \bar{C} + \bar{D})(\bar{A} + B + C)$

b. SOP

	$\bar{C}$		C		
$\bar{A}$	1	0	0	0	$\bar{B}$
	1	0	0	0	B
A	1	1	1	1	
	0	0	1	1	$\bar{B}$
	$\bar{D}$	D		$\bar{D}$	

POS

	C		$\bar{C}$		
A	1	0	0	0	B
	1	0	0	0	$\bar{B}$
$\bar{A}$	1	1	1	1	
	0	0	1	1	B
	D		$\bar{D}$	D	

$F = AC + AB + \bar{A}\bar{C}\bar{D}$

$F = (A+\bar{C})(A+\bar{D})(\bar{A}+B+C)$

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c. $F = ABC + \bar{A}\bar{B}C + AB\bar{D} + \bar{A}B\bar{E} + C\bar{E} + \bar{D}\bar{E}$

SOP

	$\bar{D}$		D		
$\bar{A}$	1	0	0	0	$\bar{C}$
$\bar{B}$	1	1	1	1	C
B	1	0	0	1	
	1	0	0	1	$\bar{C}$
	$\bar{E}$	E		$\bar{E}$	

	$\bar{D}$		D		
A	1	0	0	0	$\bar{C}$
$\bar{B}$	1	0	0	1	C
B	1	1	1	1	
	1	1	0	0	$\bar{C}$
	$\bar{E}$	E		$\bar{E}$	

$F = ABC + \bar{A}\bar{B}C + AB\bar{D} + \bar{A}B\bar{E} + C\bar{E} + \bar{D}\bar{E}$

POS

	D		$\bar{D}$		
A	1	0	0	0	C
B	1	1	1	1	$\bar{C}$
$\bar{B}$	1	0	0	1	
	1	0	0	1	C
	E		$\bar{E}$	E	

	D		$\bar{D}$		
$\bar{A}$	1	0	0	0	C
B	1	0	0	1	$\bar{C}$
$\bar{B}$	1	1	1	1	
	1	1	0	0	C
	E		$\bar{E}$	E	

$F = (B+C+\bar{E})(B+C+\bar{D})(A+\bar{B}+\bar{E})(\bar{A}+B+\bar{E})(\bar{A}+C+\bar{D})$

3. a. $A\bar{B} + \bar{C}(D + AB + \bar{A}B)$

$\equiv A\bar{B} + \bar{C}(D + B)$ (arbsorbsi)

A	B	C	D	F
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0

A	B	C	D	F
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	0
1	1	1	1	0

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(b.) $A\bar{B} + D(B\bar{C} + \bar{A}\bar{B}) + AB\bar{D}$

$\equiv A(\bar{B} + B\bar{D}) + DB\bar{C} + D\bar{A}\bar{B}$ (distribusi)

$\equiv A(\bar{B} + \bar{D}) + DB\bar{C} + D\bar{A}\bar{B}$ (anbsorbsi)

$\equiv A\bar{B} + A\bar{D} + DB\bar{C} + D\bar{A}\bar{B}$ (distribusi)

$\equiv \bar{B}(A + \bar{A}D) + A\bar{D} + DB\bar{C}$ (distribusi)

$\equiv \bar{B}(A + D) + A\bar{D} + DB\bar{C}$ (anbsorbsi)

$\equiv A\bar{B} + \bar{B}D + A\bar{D} + DBC$ (distribusi)

$\equiv A\bar{B} + D(\bar{B} + BC) + A\bar{D}$ (distribusi)

$\equiv A\bar{B} + D(\bar{B} + C) + A\bar{D}$ (anbsorbsi)

$\equiv A\bar{B} + D\bar{B} + DC + A\bar{D}$ (distribusi)

$\equiv D\bar{B} + DC + A\bar{D}$ (konsensus)

$\equiv D(\bar{B} + C) + A\bar{D}$ (distribusi)

A	B	C	D	F
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

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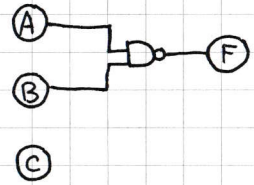
(4.)(a.) $\bar{A}\bar{B} + \bar{A}B + A\bar{B}C$

	$\bar{B}$		B	
$\bar{A}$	1	1	1	1
A	1	1	0	0
	$\bar{C}$	C	$\bar{C}$	

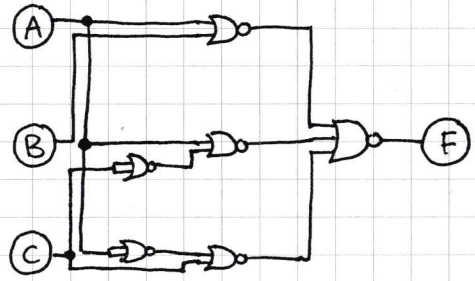


$F = \bar{A} + \bar{B} = \overline{AB}$

(b.) $(A+B)(A+\bar{B}+\bar{C})(\bar{A}+B+C)(\bar{A}+\bar{B}+C)$

	B		$\bar{B}$	
A	0	0	0	1
$\bar{A}$	0	1	1	0
	C	$\bar{C}$	C	

$F = (A+B)(\bar{A}+C)(A+\bar{C})$



(5.)

$\bar{A}$	$\bar{D}$		D		
$\bar{B}$	0	0	1	1	$\bar{C}$
	X	X	1	1	C
B	1	0	0	1	
	0	X	0	X	$\bar{C}$
	$\bar{E}$	E	$\bar{E}$		

A	$\bar{D}$		D	
$\bar{B}$	X	1	0	X
	1	1	X	X
	1	X	X	1
B	0	1	1	0
	$\bar{E}$	E	$\bar{E}$	

> PI dan >> EPI

1. $C\bar{E}$ (EPI)
2. AC
3. $\bar{B}C$
4. $\bar{A}\bar{B}D$ (EPI)
5. $AB\bar{E}$ (EPI)
6. $A\bar{D}E$
7. $A\bar{B}\bar{D}$
8. $\bar{A}D\bar{E}$
9. $\bar{B}D\bar{E}$
10. $A\bar{B}\bar{E}$
11. $B\bar{C}\bar{D}E$

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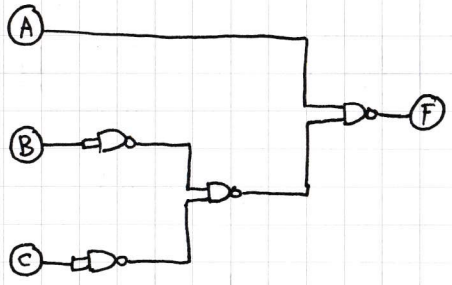
(4) (a.) 2nd Version

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

	$\bar{B}$		B	
	$\bar{C}$	C	$\bar{C}$	
$\bar{A}$	1	1	1	1
A	1	0	0	0

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

$= \overline{(A.(B+C))}$

$= (A.(\bar{B}\bar{C})')'$