LAB 6

Sequential Circuit Project 2

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Kelas : PSD-C

1. Buat *excitation table*, beserta penentuan input flip flop, menggunakan templat tabel yang terdapat di akhir dokumen ini (4 baris pertama telah diisi untuk Anda). Anda dapat menggunakan excitation table dari awal dokumen untuk membantu menentukan input flip flop.

Current State			Input		Next State			T	JK		D	Out
X	Y	Z	A	B	X+	Y+	Z+	Tx	Jy	Ky	Dz	O
0	**0**	**0**	**0**	**0**	0	0	1	0	0	X	1	0
0	**0**	**0**	**0**	**1**	0	0	0	0	0	X	0	0
0	**0**	**0**	**1**	**0**	0	1	0	0	1	X	0	0
0	**0**	**0**	**1**	**1**	0	0	0	0	0	X	0	0
0	**0**	**1**	**0**	**0**	0	1	0	0	1	X	0	0
0	**0**	**1**	**0**	**1**	0	0	0	0	0	X	0	0
0	**0**	**1**	**1**	**0**	0	1	1	0	1	X	1	0
0	**0**	**1**	**1**	**1**	0	0	0	0	0	X	0	0
0	**1**	**0**	**0**	**0**	0	1	1	0	X	0	1	0
0	**1**	**0**	**0**	**1**	0	0	0	0	X	1	0	0
0	**1**	**0**	**1**	**0**	1	0	0	1	X	1	0	0
0	**1**	**0**	**1**	**1**	0	0	0	0	X	1	0	0
0	**1**	**1**	**0**	**0**	1	0	0	1	X	1	0	0
0	**1**	**1**	**0**	**1**	0	0	0	0	X	1	0	0
0	**1**	**1**	**1**	**0**	1	0	1	1	X	1	1	0
0	**1**	**1**	**1**	**1**	0	0	0	0	X	1	0	0
1	**0**	**0**	**0**	**0**	1	0	1	0	0	X	1	0
1	**0**	**0**	**0**	**1**	0	0	0	1	0	X	0	0
1	**0**	**0**	**1**	**0**	0	0	0	1	0	X	0	1
1	**0**	**0**	**1**	**1**	0	0	0	1	0	X	0	0
1	**0**	**1**	**0**	**0**	0	0	0	1	0	X	0	1
1	**0**	**1**	**0**	**1**	0	0	0	1	0	X	0	0
1	**0**	**1**	**1**	**0**	0	0	1	1	0	X	1	1
1	**0**	**1**	**1**	**1**	0	0	0	1	0	X	0	0

T	X'\A'		X'\A		
X' Y'	0 **0**	1 **0**	3 **0**	2 **0**	X' Z'
	4 **0**	5 **0**	7 **0**	6 **0**	X' Z
X' Y	12 **1**	13 **0**	15 **0**	14 **1**	
	8 **0**	9 **0**	11 **0**	10 **1**	X' Z'
	X' B'	X' B		X' B'	

T	X\A'		X\A		
X Y'	0 **0**	1 **1**	3 **1**	2 **1**	X Z'
	4 **1**	5 **1**	7 **1**	6 **1**	X Z
X Y	12 **X**	13 **X**	15 **X**	14 **X**	
	8 **X**	9 **X**	11 **X**	10 **X**	X Z'
	X B'	X B		X B'	

Output T = (X.A) + (X.B) + (X.Z) + (Y.A.B') + (Y.Z.B')

J	X'A'		X'A		
X' Y'	X `0`	X `1`	X `3`	X `2`	X' Z'
	1 `4`	0 `5`	0 `7`	1 `6`	X' Z
X' Y	X `12`	X `13`	X `15`	X `14`	X' Z'
	X `8`	X `9`	X `11`	X `10`	
	X' B'		X' B		X' B'

J	X A'		X A		
X Y'	0 `0`	0 `1`	0 `3`	0 `2`	X Z'
	0 `4`	0 `5`	0 `7`	0 `6`	X Z
X Y	X `12`	X `13`	X `15`	X `14`	X Z'
	X `8`	X `9`	X `11`	X `10`	
	X B'		X B		X B'

Output J = (X'.A.B') + (X'.Z.B')

K-map 1

K	X' A'		X' A		
X' Y'	X 0	X 1	X 3	X 2	X' Z'
	X 4	X 5	X 7	X 6	X' Z
X' Y	1 12	1 13	1 15	1 14	X' Z'
	0 8	1 9	1 11	1 10	X' Z'
	X' B'	X' B		X' B'	

K-map 2

K	X A'		X A		
X Y'	X 0	X 1	X 3	X 2	X Z'
	X 4	X 5	X 7	X 6	X Z
X Y	X 12	X 13	X 15	X 14	X Z'
	X 8	X 9	X 11	X 10	X Z'
	X B'	X B		X B'	

Output K = A + B + Z

First K-map

D	X' A'		X' A		
X' Y'	1 (0)	0 (1)	0 (3)	0 (2)	X' Z'
	0 (4)	0 (5)	0 (7)	1 (6)	X' Z
X' Y	0 (12)	0 (13)	0 (15)	1 (14)	
	1 (8)	0 (9)	0 (11)	0 (10)	X' Z'
	X' B'	X' B		X' B'	

Second K-map

D	X A'		X A		
X Y'	1 (0)	0 (1)	0 (3)	0 (2)	X Z'
	0 (4)	0 (5)	0 (7)	1 (6)	X Z
X Y	X (12)	X (13)	X (15)	X (14)	
	X (8)	X (9)	X (11)	X (10)	X Z'
D	X B'	X B		X B'	

Output D = (Z'.A'.B') + (Z.A.B')

O	X' A'		X' A		
X' Y'	0 **0**	0 **1**	0 **3**	0 **2**	X' Z'
	0 **4**	0 **5**	0 **7**	0 **6**	X' Z
X' Y	0 **12**	0 **13**	0 **15**	0 **14**	
	0 **8**	0 **9**	0 **11**	0 **10**	X' Z'
O	X' B'	X' B		X' B'	

O	X A'		X A		
X Y'	0 **0**	0 **1**	0 **3**	1 **2**	X Z'
	1 **4**	0 **5**	0 **7**	1 **6**	X Z
X Y	X **12**	X **13**	X **15**	X **14**	
	X **8**	X **9**	X **11**	X **10**	X Z'
O	X B'	X B		X B'	

Output O = (X.A.B') + (X.Z.B')

Resume outputs:

Output T = (X.A) + (X.B) + (X.Z) + (Y.A.B') + (Y.Z.B')

Bentuk lebih sederhana : X(A + B + Z) + Y.B'(A + Z)

Output J = (X'.A.B') + (X'.Z.B')

Bentuk lebih sederhana : X'B'(A + Z)
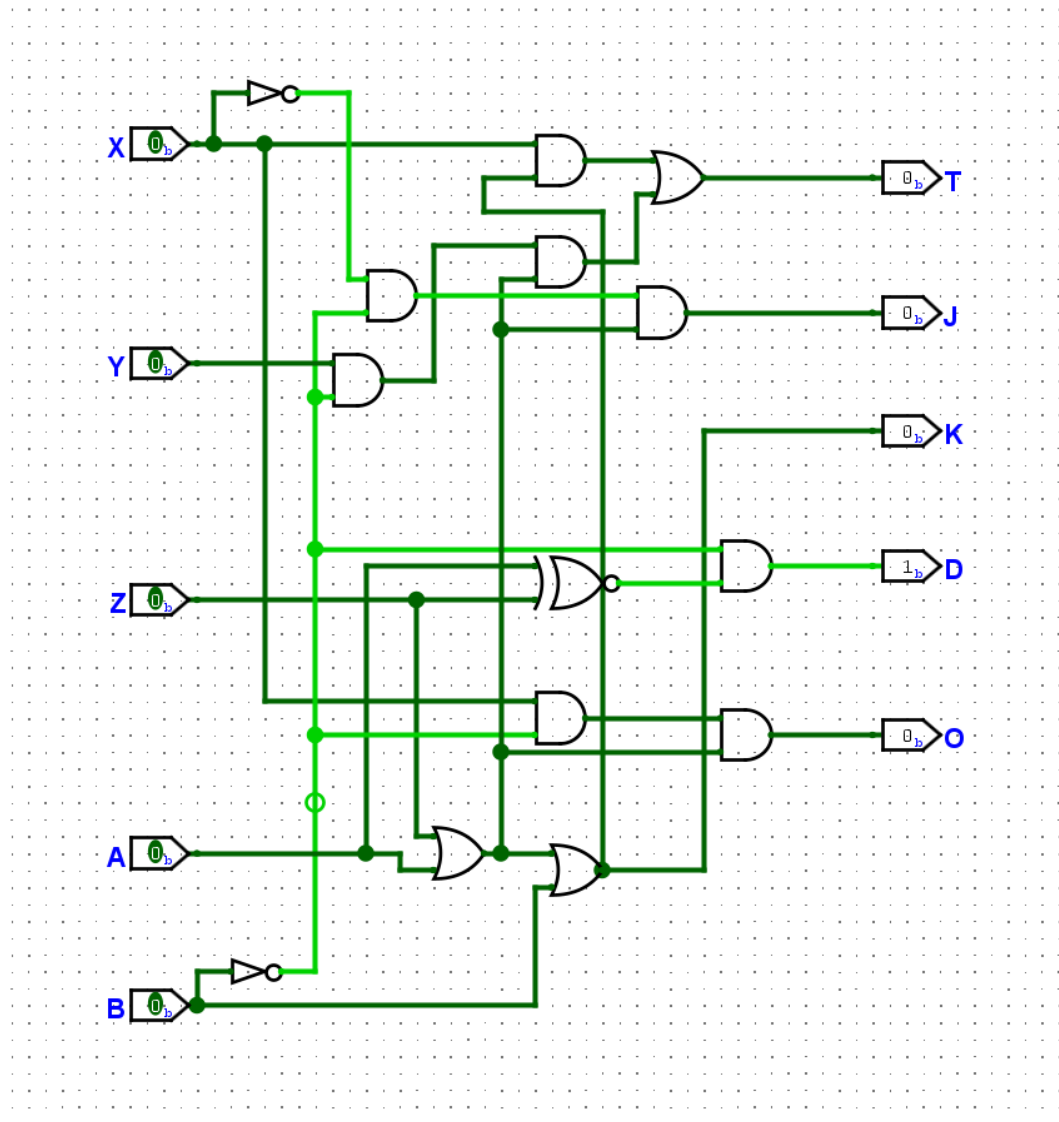
Output K = A + B + Z

Output D = (Z'.A'.B') + (Z.A.B')

Bentuk lebih sederhana: B'(Z'A' + Z.A) = B'(Z XNOR A)

Output O = (X.Z.B') + (X.A.B')

Bentuk lebih sederhana : X.B'(Z+A)

LAMPIRAN

1. Combinational Circuit

2. Sequential Circuit