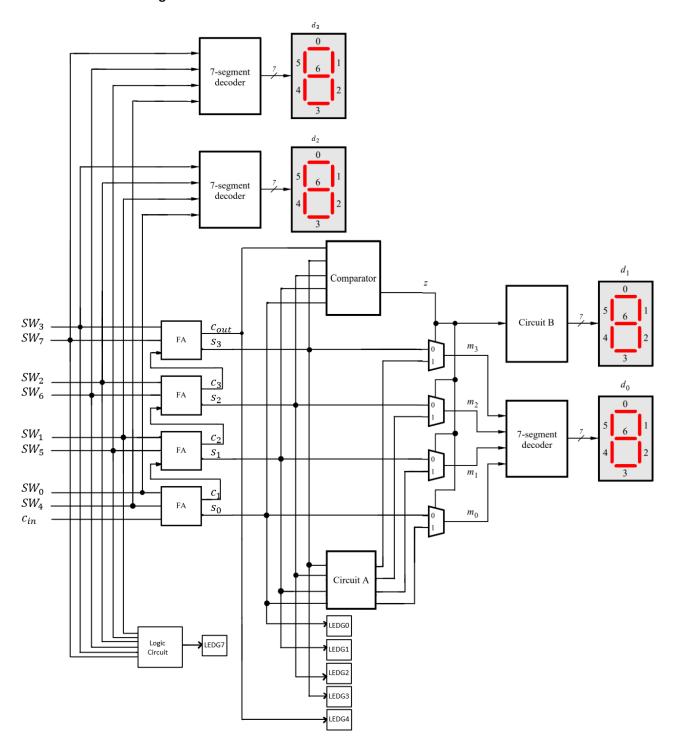
## circuit diagram



Truth table for circuit A					K-map and logic expressions		
Decimal	S3	S2	S1	S0	A0	SoSI	
	0	1	x	x	d	<b>\</b>	
	1	0	0	х	d	S <sub>2</sub> S <sub>3</sub> 00 01 11 10	
10	1	0	1	0	0		
11	1	0	1	1	1	01 0 1 0	
12	1	1	0	0	0	11 0 0 1 1	
13	1	1	0	1	1	10 (2) 2 (2)	
14	1	1	1	0	0	$A_0 = S_0$	
15	1	1	1	1	1		
16	0	0	0	0	0		
17	0	0	0	1	1		
10	0	0	1	0	0		
18							
19	0	0	1	1	1		
		0 S2	1 S1	1 S0	1 A1	C C.	
19	0	<u> </u>				S <sub>0</sub> S <sub>1</sub>	
19	0	S2	S1	S0	A1	S2S3 00 01 11 10	
19	0 S3 0	S2 1	S1 x	S0 x	A1	S <sub>2</sub> S <sub>3</sub> 00 01 11 10 00 T	
19 Decimal	0 S3 0 1	S2 1 0	S1 x 0	SO x	A1 d d	S <sub>2</sub> S <sub>3</sub> 00 01 11 10 00 1 0 0 1 0 0 1	
Decimal	0 S3 0 1	S2 1 0	S1 x 0 1	so x x 0	A1 d d o	S <sub>2</sub> S <sub>3</sub> 00 01 11 10 00 T 0 0 T 01 d 0 0 d	
Decimal  10  11	0 S3 0 1 1	S2 1 0 0	S1 x 0 1 1	SO x x 0 1	A1 d d 0 0	S <sub>2</sub> S <sub>3</sub> 00 01 11 10 00 1 0 0 1 01 d 0 0 d 11 1 0 0 1 10 d d d d	
19 Decimal 10 11 12	0 S3 0 1 1 1	S2 1 0 0 0	S1 x 0 1 1 0	SO	A1 d d 0 0 1	S <sub>2</sub> S <sub>3</sub> 00 01 11 10 00 1 0 0 1 01 d 0 0 d 11 1 0 0 1 10 d d d d	
19 Decimal 10 11 12 13	0 S3 0 1 1 1 1	S2 1 0 0 0 1	S1 x 0 1 1 0 0	SO	A1 d d O O 1 1	S <sub>2</sub> S <sub>3</sub> 00 01 11 10 00 T 0 0 T 01 d 0 0 d	
19 Decimal 10 11 12 13 14	0 S3 0 1 1 1 1 1	S2 1 0 0 1 1 1	S1 x 0 1 1 0 0 1 1	SO	A1 d d 0 0 1 1 1 0	S <sub>2</sub> S <sub>3</sub> 00 01 11 10 00 1 0 0 1 01 d 0 0 d 11 1 0 0 1 10 d d d d	
19 Decimal  10 11 12 13 14 15	0 S3 0 1 1 1 1 1 1	S2 1 0 0 1 1 1 1	S1 x 0 1 1 0 0 1 1	SO	A1 d d O O O O O O O O O O O O O O O O O	S <sub>2</sub> S <sub>3</sub> 00 01 11 10 00 1 0 0 1 01 d 0 0 d 11 1 0 0 1 10 d d d d	
19  Decimal  10  11  12  13  14  15  16	0 S3 0 1 1 1 1 1 1 1 1 0	S2 1 0 0 1 1 1 1 0	S1 x 0 1 1 0 0 1 1 0 0	SO	A1 d d d O O 1 1 O O 1	S <sub>2</sub> S <sub>3</sub> 00 01 11 10 00 1 0 0 1 01 d 0 0 d 11 1 0 0 1 10 d d d d	

Decimal	S3	S2	S1	S0	A2	
	0	1	x	x	d	S
	1	0	0	x	d	
10	1	0	1	0	0	
11	1	0	1	1	0	
12	1	1	0	0	0	
13	1	1	0	1	0	
14	1	1	1	0	1	
15	1	1	1	1	1	
16	0	0	0	0	1	
17	0	0	0	1	1	
18	0	0	1	0	0	
19	0	0	1	1	0	
Decimal	S3	S2	S1	S0	А3	
Decimal	S3 0	S2 1	S1	so x	A3	
Decimal						Ç
Decimal  10	0	1	х	x	d	Ç
	0	1	x 0	x	d d	S
10	0 1 1	0 0	x 0 1	x x	d d	S
10	0 1 1	1 0 0	x 0 1	x x 0 1	d d 0 0	2
10 11 12	0 1 1 1	1 0 0 0	x 0 1 1	x x 0 1	d d 0 0 0	5
10 11 12 13	0 1 1 1 1	1 0 0 0 1	x 0 1 1 0	x 0 1 0	d d 0 0 0 0 0	5
10 11 12 13	0 1 1 1 1 1	1 0 0 0 1 1	x 0 1 1 0 0	x 0 1 0 1	d d 0 0 0 0 0 0 0 0	S
10 11 12 13 14 15	0 1 1 1 1 1 1	1 0 0 1 1 1	x 0 1 1 0 0	x 0 1 0 1 0	d d 0 0 0 0 0 0 0 0 0	5
10 11 12 13 14 15	0 1 1 1 1 1 1 0	1 0 0 1 1 1 1	x 0 1 1 0 0 1 1	x 0 1 0 1 0 1	d d 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S
10 11 12 13 14 15 16	0 1 1 1 1 1 1 0	1 0 0 1 1 1 1 0	x 0 1 1 0 0 1 1 0	x x 0 1 0 1 0 1	d d O O O O O O O O O O O O O O O O O O	S

SoSI					
S.S.	00	01	11	10	
00		0	0		
ol	d	0	0	d	
11	0			Q	
10	d	d	d	d	

A2 =	Si	S₂	+	SIS2
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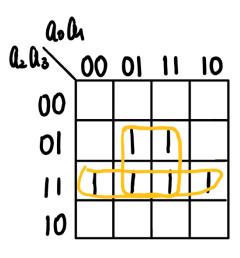
So	SoSI				
SiSi	00	01	11	10	
00	0			0	
ol	d	0	0	d	
11	0	0	0	0	
10	d	d	d	d	

## • logic expression for LEDG7

let LEG7  $\leq$  f(a) + f(b)

truth table and K-map for f(a)

a3	a2	a1	a0	f(a)
0	x	x	x	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1



f(a) = a1\*a3 + a2\*a3

Similarly, f(b) = b1\*b3 + b2\*b3

Hence, LEDG7 = a1\*a3 + a2\*a3 + b1\*b3 + b2\*b3