CSE260 Assignment 3

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SECTION: 6

CSE260 ASSIGNMENT 03

(1) $F(A,B,C,D) = \sum(0,2,7,11,12,14) + d(3,4,5,6)$

Step 1	
0	0000
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
11	1011
12	1100
14	1110

Step 2		
0	0000	A ✓
2	0010	✓
4	0100	B ✓
3	0011	✓
5	0101	✓
6	0110	C ✓
12	1100	✓
7	0111	✓
11	1011	D ✓
14	1110	✓

Prime Implicants	AB CD	Representation
	11 0 -	AB C'
	0 - - 0	B' C' D'
	- 1 - 0	A' C'
	- - 1 0	C' D
	0 - 1 -	B' D

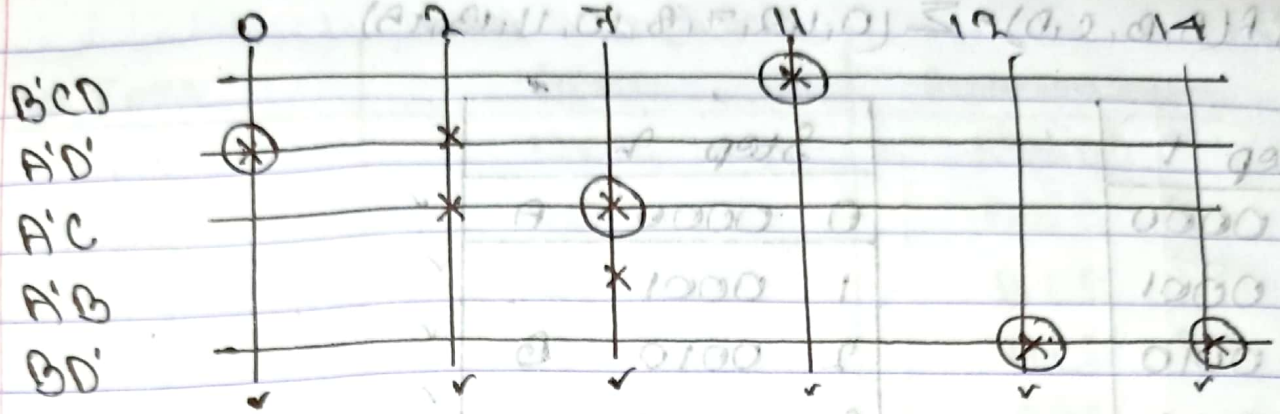
Step 3		
(0,1)	00_0	A ✓
(0,4)	0_00	✓
(2,3)	001_	✓
(2,6)	0_10	✓
(4,5)	010_	B ✓
(4,6)	01_0	✓
(4,12)	-100	✓
(3,7)	0_11	✓
(3,11)	-011	✓
(5,7)	01_1	C ✓
(6,7)	011_	✓
(6,14)	-110	✓
(12,14)	11_0	✓

Step 4	
(0,2,4,6)	0--0 A
(0,4,2,6)	0-+0 A
(2,3,6,7)	0θ_1_
(2,6,3,7)	0-1-
(4,5,6,7)	01-- B
(4,6,5,7)	01-- B
(4,12,6,14)	-1-0
(4,6,12,14)	-1-0

Step 5
~~X~~

Prime Implicants

Min Terms	ABCD	Representation
(3,11)	-011	B'CD
(0,2,4,6)	0--0	~~B'D'~~ A'D'
(2,3,6,7)	0-1-	A'C
(4,5,6,7)	01--	A'B
(4,6,12,14)	-1-0	BD'



$A'D' + A'C + B'CD + BD'$ (Ans)

(2) $F(A,B,C,D) = \Sigma(0,1,2,7,8,10,11,13,15)$

Step 1	
0	0000
1	0001
2	0010
7	0111
8	1000
10	1010
11	1011
13	1101
15	1111

Step 2		
0	0000	A
1	0001	
2	0010	B
8	1000	
10	1010	C
7	0111	
11	1011	D
13	1101	
15	1111	

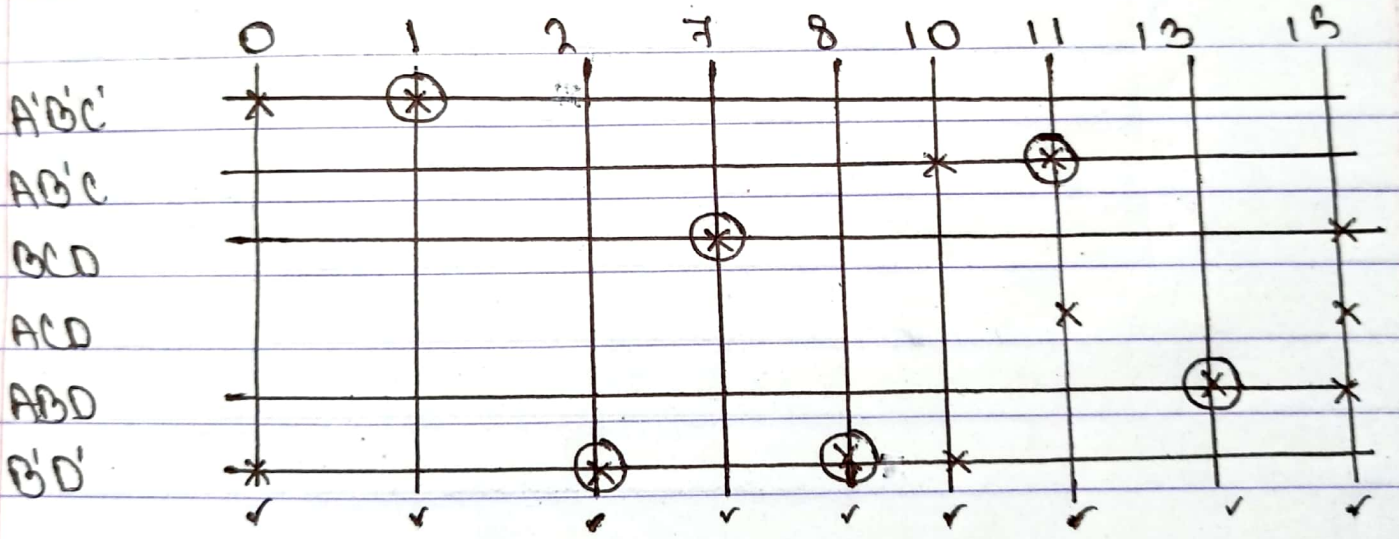
Step 3		
(0,1)	000-	
(0,2)	00-0	A
(0,8)	-000	
(2,10)	-010	B
(8,10)	10-0	
(10,11)	101-	C
(7,15)	-111	
(11,15)	1-11	D
(13,15)	11-1	

Step 4	
(0,2,8,10)	-0-0
(0,8,2,10)	-0-0

A

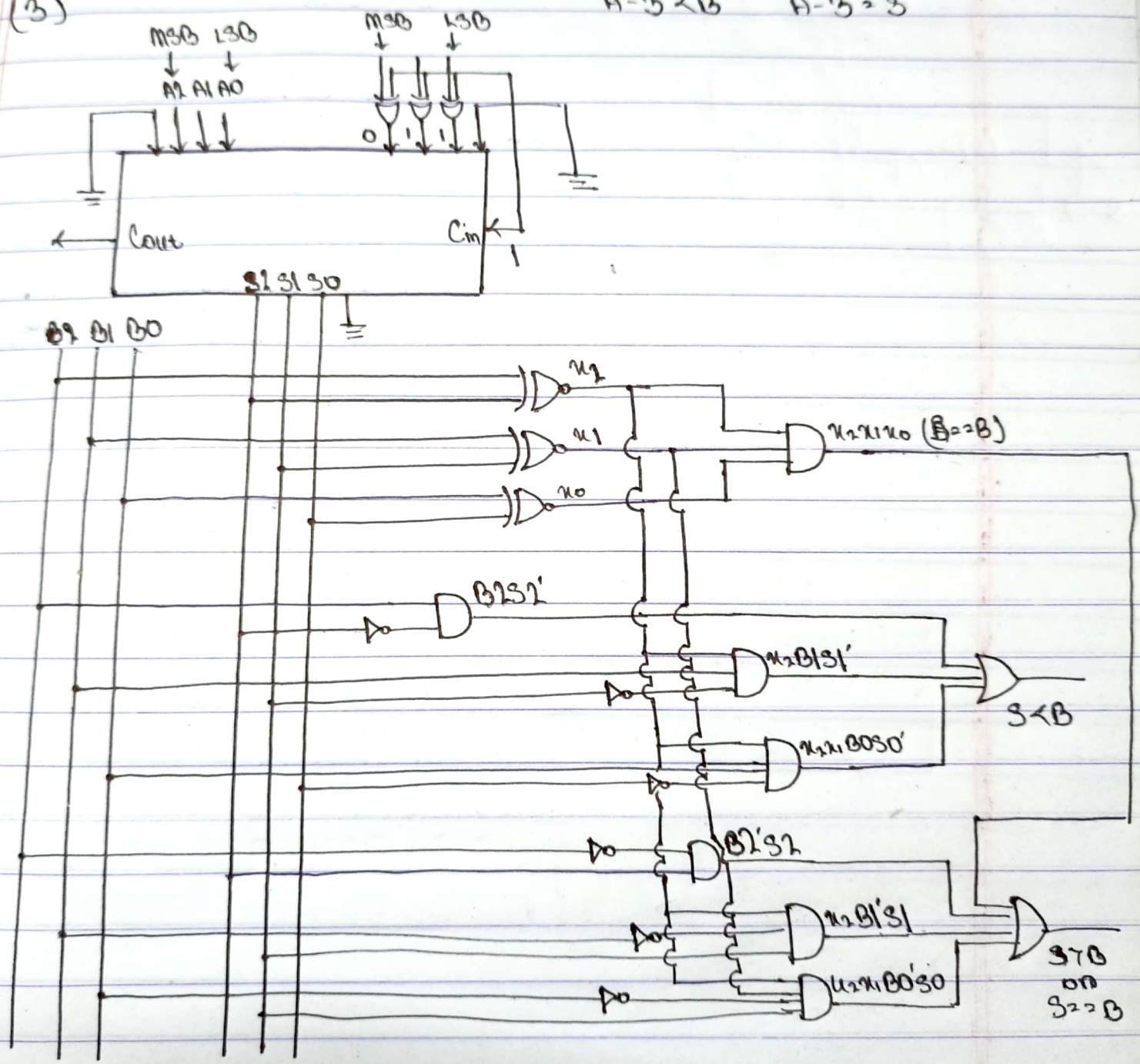
Prime Implicants

Min Terms	ABCD	Representation
(0,1)	000-	A'B'C'
(10,14)	101-	AB'C
(7,15)	-111	BCD
(11,15)	1-11	ACD
(13,15)	11-1	ABD
(0,2,8,10)	-0-0	B'D'

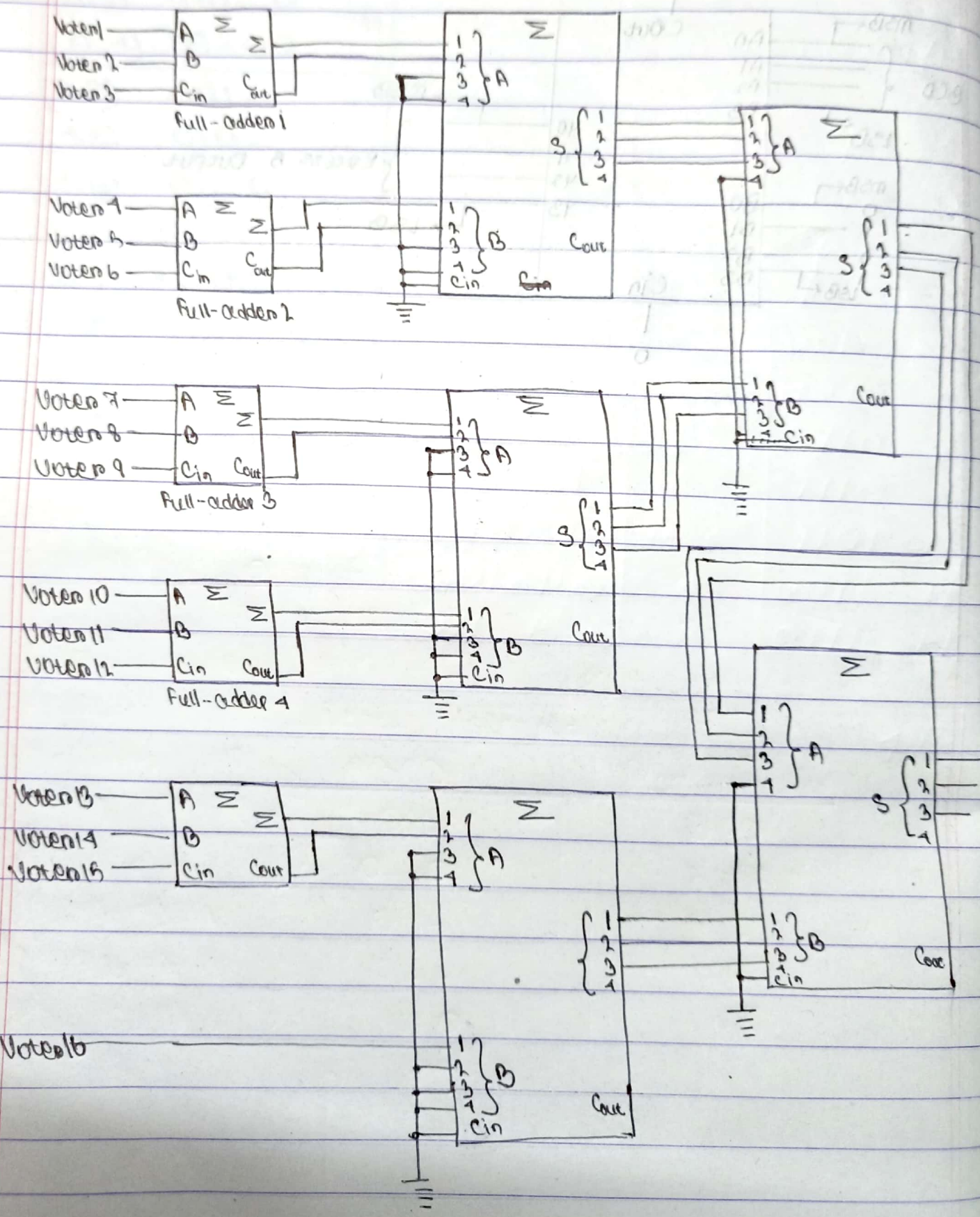


A'B'C' + AB'C + BCD + ABD + B'D'

(3) A-3<B A-3=3


MSB LSB
A2 A1 A0
MSB LSB
0 1 1
Cout
Cin
1
S2 S1 S0
B2 B1 B0
x2
x1
x0
x2x1x0 (A=B)
B2S2'
x2B1S1'
S<B
x2x1B0S0'
B2'S2
x2B1'S1
x1x0B0'S0
S>B
OR
S2=B

(4) 16 people voted system



(5) BCD to excess 3 system using parallel adder(4)