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ECE 218
Assignment 3

3.2) c) $F(x,y,z) = \Sigma(2,3,4,5)$

x \ yz	00	01	11	10
0	0	0	1	1
1	1	1	0	0

$F = x'y + xy'$

d) $F(x,y,z) = \Sigma(1,2,3,5,6,7)$

x \ yz	00	01	11	10
0	0	1	1	1
1	0	1	1	1

$F = Y + Z$

3.7) b) $AD' + B'C'D + BCD' + BC'D$

AB \ CD	00	01	11	10
00	0	1	0	0
01	0	1	0	1
11	1	1	0	0
10	1	1	0	1

$F = AC' + C'D + AD' + BCD'$

c) $AB'C + B'C'D' + BCD + ACD' + A'B'C + A'BC'D$

AB \ CD	00	01	11	10
11	1	0	1	1
01	0	1	1	0
11	0	0	1	1
10	1	0	1	1

$F = AC + CD + A'BD + A'B'D' + AB'D'$

3. B) b) $ACD' + C'D + AB' + ABCD$

AB \ CD	00	01	11	10
00	0	1	0	0
01	0	1	0	0
11	0	1	1	1
10	1	1	1	1

Sum of Products:
$F = AC + AB' + C'D$
Product of sums:
$F = (A' + C') \cdot (A' + B) \cdot (C + D')$

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

AB \ CD	00	01	11	10
01	1	1	1	1
01	1	0	1	1
11	0	0	0	0
10	1	0	0	1

Sum of Products:
$F = A'C + A'B' + AB'D' + A'C'D'$
Product of Sums:
$F = (A + C')(A + B)(A' + B + D)(A + C + D)$

3.15) c) $F(A,B,C,D) = \Sigma(5,6,7,12,14,15), d=(3,9,11)$

AB \ CD	00	01	11	10
00	0	0	0	X
01	0	1	1	1
11	0	X	0	X
10	1	0	1	1

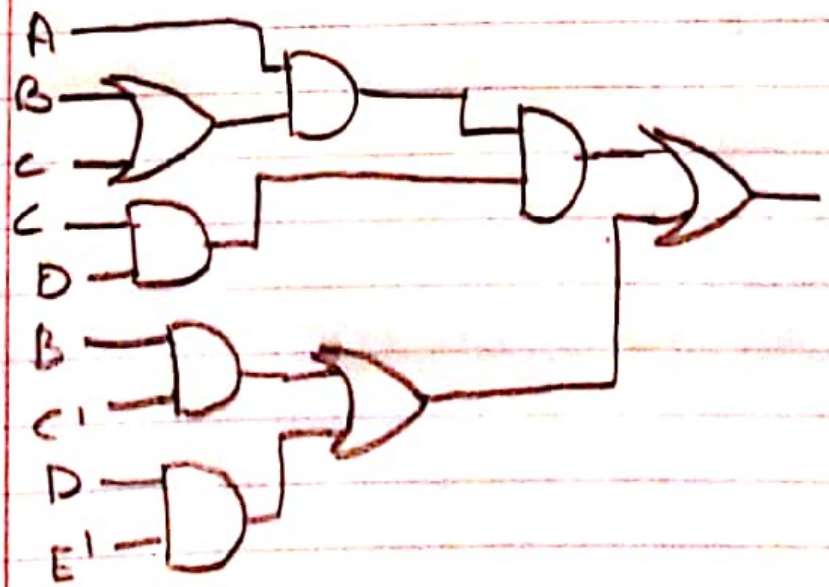
$F = CD' + A'BD + AB'C + AB'D'$

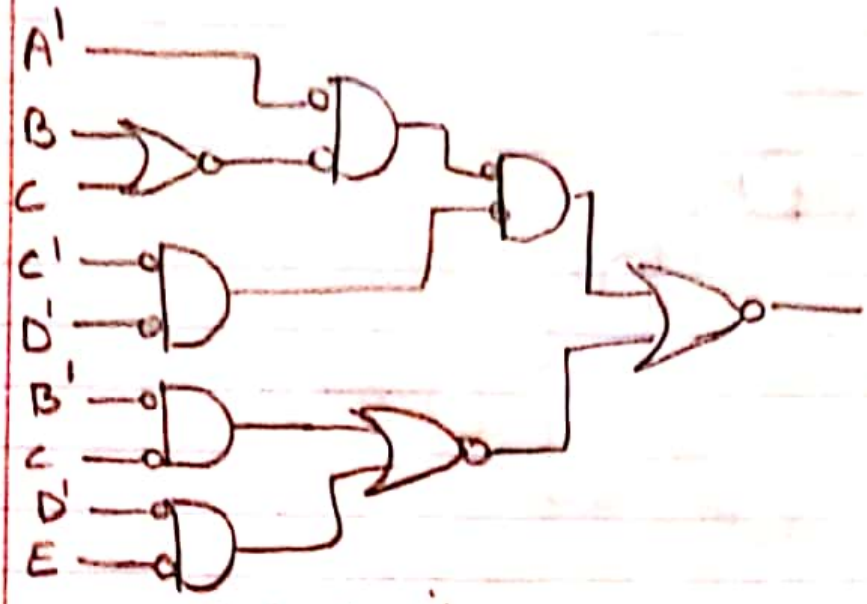
d) $F(A,B,C,D) = \Sigma(4,12,7,2,10), d=(0,6,8)$

AB \ CD	00	01	11	10
00	X	0	1	0
01	1	0	X	1
11	X	0	1	0
10	1	0	0	0

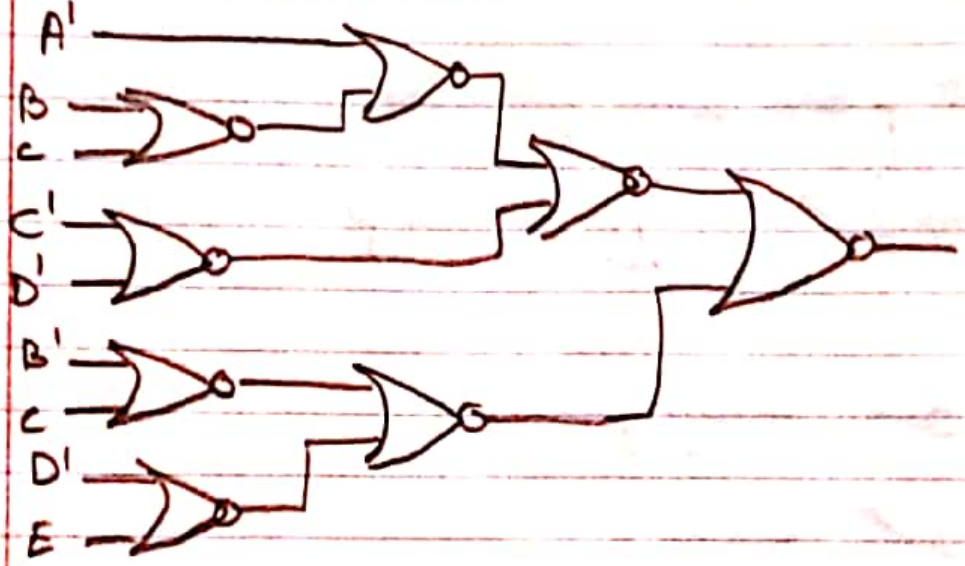
$F = C'D' + A'CD + A'BC + BCD$

3.20) a) $CD(B+C)A + (BC' + DE')$

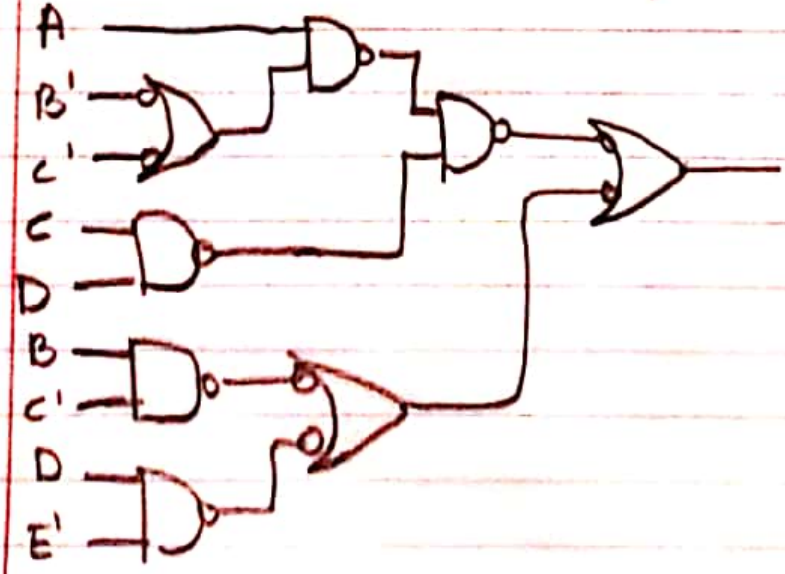




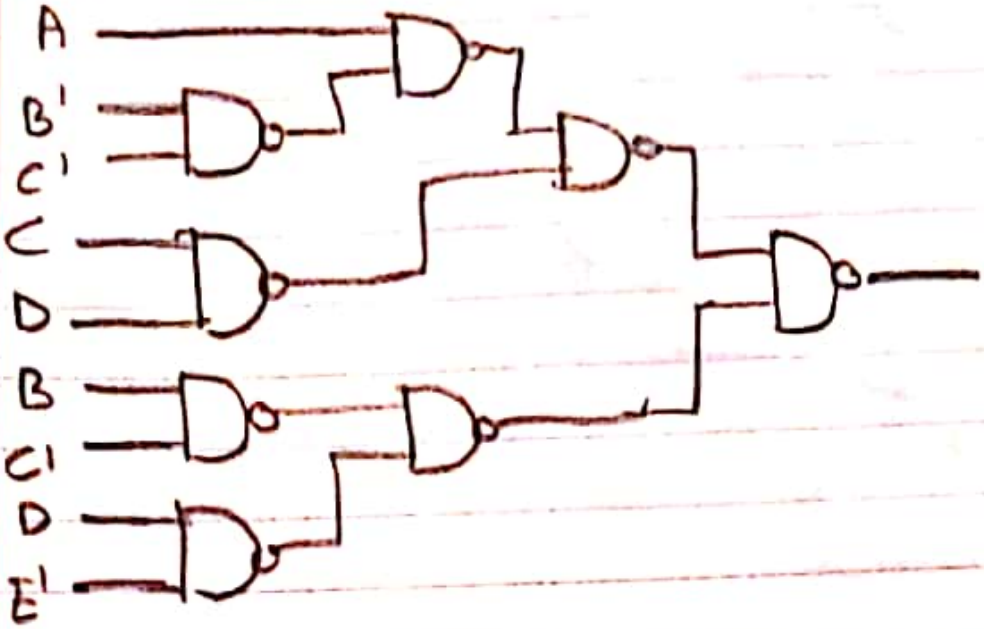
NOR Circuit



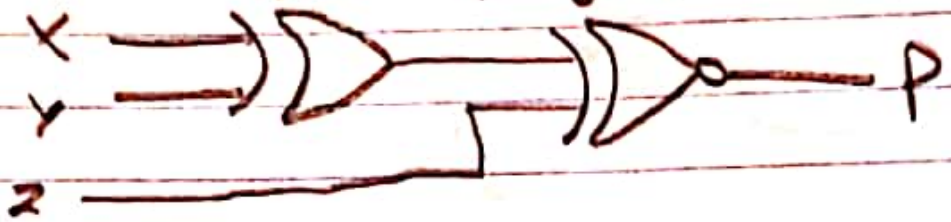
b) $CD(B+C)A + (BC' + DE')$



NAND Circuit



3.28) 3-bit odd parity generator



4-bit odd parity generator