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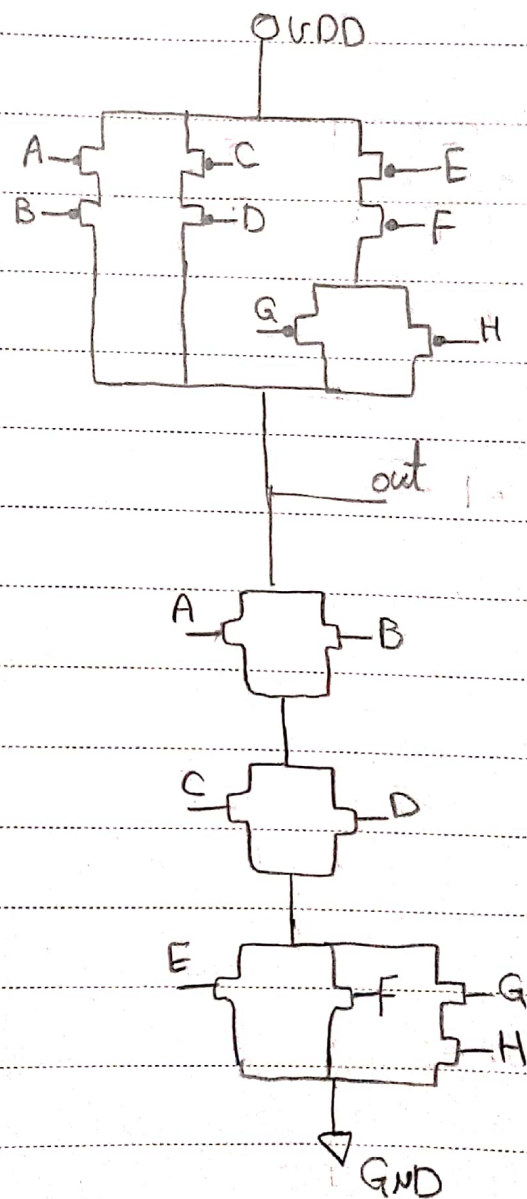
1,

a) $Y = ((A+B)(C+D)(E+F+GH))'$

$\overline{Y} = ((A+B)(C+D)(E+F+GH)) = (A+B)(C+D)(E+F+GH) \rightarrow N\text{-network}$

$D(\overline{Y}) = (AB) + (CD) + (E.F.(G+H)) \rightarrow P\text{-network}$

16 ترانزیستور

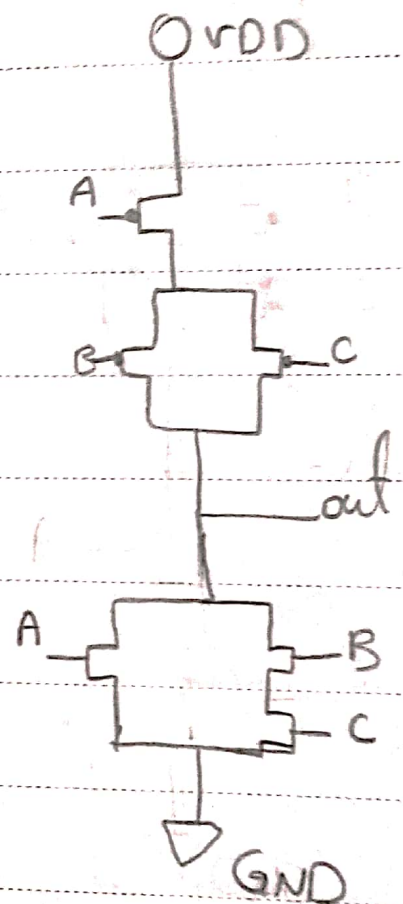


$$b) Y = (A+B)' + A'C' \Rightarrow \bar{A} \cdot \bar{B} + \bar{A} \bar{C} \Rightarrow \bar{A}(\bar{B} + \bar{C})$$

$$\bar{Y} = A + (BC) \rightarrow N\text{-network}$$

$$D(\bar{Y}) = A(B+C) \rightarrow p\text{-network}$$

6 ترانزیستور



2)

a) $f(A, B, C, D, E) = \prod M(1, 4, 6, 7, 9, 12, 15, 17, 20, 21, 22, 23, 28, 31)$

BC \ DE	00	01	11	10
00		0	0	
01	0			0
11		0	0	
10		0		

\bar{A}

BC \ DE	00	01	11	10
00		0	0	
01	0	0		
11		0	0	
10		0		

A

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

b) $f(A, B, C, D) = \sum m(1, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 15)$

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

SOP $\Rightarrow B + D$

$= \prod M(0, 2, 3, 5, 7, 11, 13, 14, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31)$

3,

$a, f(a, b, c, d, e) =$

$\sum_m (1, 4, 6, 7, 9, 10, 12, 15, 17, 20, 23, 25, 26, 27, 28, 30, 31) \cdot d(8, 16, 21, 22)$

		bc			
		00	01	11	10
de	00		1	1	d
	01	1			1
	11		1	1	
	10		1		1

\bar{a}

		bc			
		00	01	11	10
de	00	d	1	1	
	01	1	d		1
	11		1	1	1
	10		d	1	1

a

sop $\Rightarrow abd + cd\bar{e} + b\bar{c}d\bar{e} + \bar{b}c\bar{e} + \bar{c}de + cde$

$$= \prod M(0, 2, 3, 5, 11, 13, 14, 18, 19, 24, 29) \cdot (8, 16, 21, 22)$$

bc de		00	01	11	10
00	0			d	
01		0	0		
11	0			0	
10	0		0		

\bar{a}

bc de		00	01	11	10
00	d				0
01		d	0		
11	0				
10	0	d			

a

$$P.S \Rightarrow (b+c+\bar{d})(\bar{b}+\bar{c}+\bar{d}+e+a)(a+c+\bar{d}+\bar{e})(c+d+e)(\bar{c}+d+\bar{e})$$

b, $f(a, b, c, d, e) =$

$\prod_M(0, 1, 2, 3, 5, 10, 16, 17, 18, 19, 24, 26) \cdot d(7, 9, 11, 21, 27)$

$= \sum_m(4, 6, 8, 12, 13, 14, 15, 20, 22, 23, 25, 28, 29, 30, 31) \cdot d(7, 9, 11, 21, 27)$

bc de	00	01	11	10
00		1	1	1
01			1	d
11		d	1	d
10		1	1	

\bar{a}

bc de	00	01	11	10
00		1	1	
01		d	1	1
11		1	1	d
10		1	1	

a

Sop $\Rightarrow c\bar{e} + be + \bar{A}B\bar{D} + CD$

bc de	00	01	11	10
00	0			
01	0	0		d
11	0	d		d
10	0			0

\bar{a}

bc de	00	01	11	10
00	0			0
01	0	d		
11	0			d
10	0			0

a

Pos $\Rightarrow (b+c)(a+b+\bar{e})(\bar{a}+c+e)(c+\bar{d})$