Home-Work-5

ME19B030
Nama Bhargav

Date: __/__/____

1. $F = \bar{R}S\bar{T} + R\bar{S}T + RST$

(a)

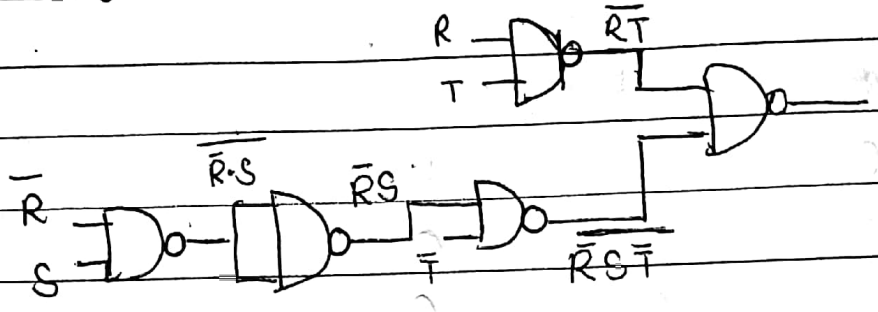
R \ ST	$\bar{S}\bar{T}$	$S\bar{T}$	ST	ST'
R'	0			1
R	1	1	1	

$\rightarrow R'ST' \Rightarrow F = R'ST' + RT$ //

$\rightarrow RT$

(b) $\Pi(0,1,2,4,6) = S_1 \cdot S_2 \cdot S_3 = (R+T')(S+T)(R'+T)$

(c) $\bar{F} = RT + \bar{R}S\bar{T} = \overline{RT} \cdot \overline{\bar{R}S\bar{T}}$



2. $F(ABCD) = 1$ //

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

$\rightarrow A'B'D'$

$\rightarrow BCD'$

$\rightarrow BC'D$

$F = \bar{A}\bar{B}\bar{D} + BC\bar{D} + B\bar{C}D$

$\rightarrow \bar{F} = \bar{A}\bar{B}\bar{D} + BC\bar{D} + B\bar{C}D = \overline{\bar{A}\bar{B}\bar{D}} \cdot \overline{BC\bar{D}} \cdot \overline{B\bar{C}D}$ } N_4

N_1 N_2 N_3

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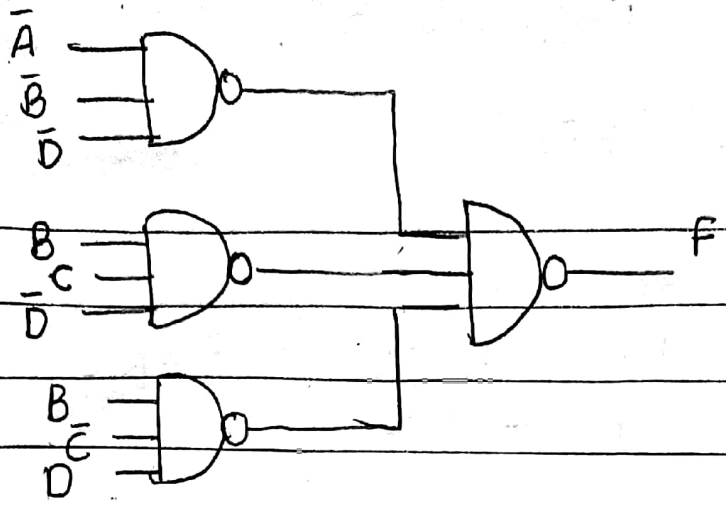

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3.

(a)

A	B	C	F
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

(b)

A \ BC	00	01	11	10
0	1	1	1	1
1	0	0	1	0

⇒ In SOP Form

⇒ $F = A' + BC$

(c) Expression of F in POS form

$F' = AB' + AC'$

(II) $F = A' + BC$

$F' = (A' + BC)' = A \cdot (BC)'$

$F'' = (A \cdot (BC)')'$

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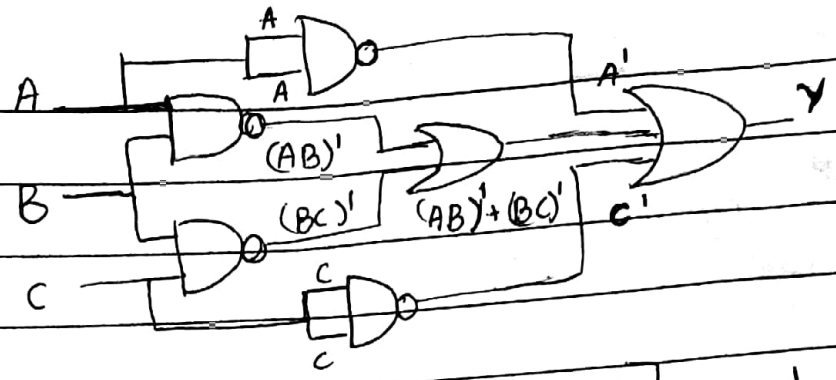
(d)

4.

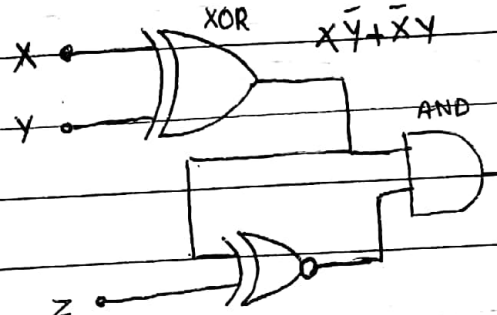
Date: __/__/____

(a)



$$Y = A' + [(AB)' + (BC)'] + C'$$
$$= A' + [(A'+B') + (B'+C')] + C'$$
$$= A' + B' + C'$$

(b)



XNOR output for A & B is $(AB + \bar{A}\bar{B})$

$$F = (x\bar{y}+\bar{x}y)\cdot[z\cdot(x\bar{y}+\bar{x}y) + \bar{z}\cdot\overline{(x\bar{y}+\bar{x}y)}]$$
$$= (x\bar{y}+\bar{x}y)\cdot[zx\bar{y}+z\bar{x}y + \bar{z}\cdot(\overline{x\bar{y}}\cdot\overline{\bar{x}y})]$$
$$= (x\bar{y}+\bar{x}y)\cdot[zx\bar{y}+z\bar{x}y + \bar{z}\cdot((\bar{x}+y)\cdot(x+\bar{y}))]$$
$$= (x\bar{y}+\bar{x}y)\cdot[zx\bar{y}+z\bar{x}y + \bar{z}\cdot[\bar{x}\bar{y}+xy]]$$
$$= (x\bar{y}+\bar{x}y)\cdot[zx\bar{y}+z\bar{x}y + \bar{z}\bar{x}\bar{y}+\bar{z}xy]$$
$$= zx\bar{y}+0+0+0+0+z\bar{x}y+0+0$$
$$= z(x\bar{y}+\bar{x}y)$$

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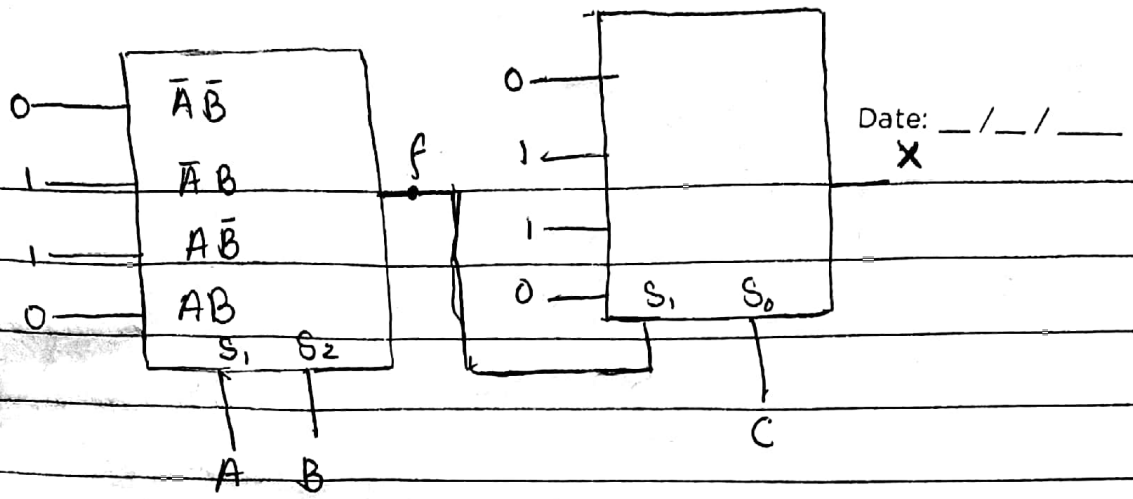
5.

(a)



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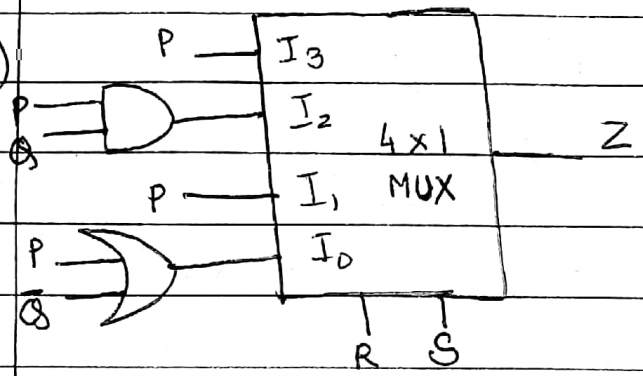
$f = 0\cdot(\bar{A}\bar{B}) + 1(\bar{A}B) + 1(A\bar{B}) + 0(AB) = A \oplus B$

$X = \bar{S}_1 S_0 + S_1 \bar{S}_0 = \overline{A \oplus B}\cdot C + A \oplus B \cdot \bar{C}$

$= A \oplus B \oplus C$

$\Rightarrow X = A\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}\bar{B}C + ABC$

(b)



$Z = \bar{R}\cdot\bar{S}(P+\bar{Q}) + \bar{R}S(P) + R\bar{S}(P\bar{Q}) + RS\cdot(P)$

$= \bar{R}\bar{S}P + \bar{R}\bar{S}\bar{Q} + \bar{R}SP + R\bar{S}P\bar{Q} + RSP$

$= \bar{R}P + \bar{R}\bar{S}\bar{Q} + R\bar{S}P\bar{Q} + RSP$ //

(or)

$= \bar{R}\bar{S}P + \bar{R}\bar{S}\bar{Q} + SP + R\bar{S}P\bar{Q}$ //

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