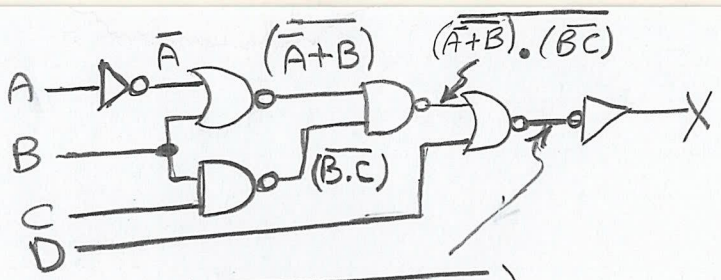
Ch5

4 (d)

& 19



$$X = \overline{(\overline{(\overline{A}+B)(\overline{BC})}+D)}$$

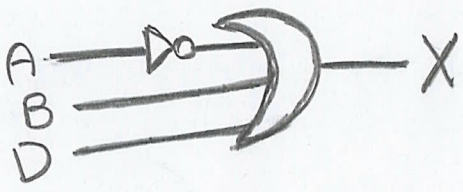
$$= \overline{(\overline{A}+B)(\overline{BC})}+D$$

$$= (\overline{\overline{A}+B}) + (\overline{\overline{BC}}) + D$$

$$= \overline{A} + B + BC + D$$

$$= \overline{A} + B + D$$

$\Rightarrow$



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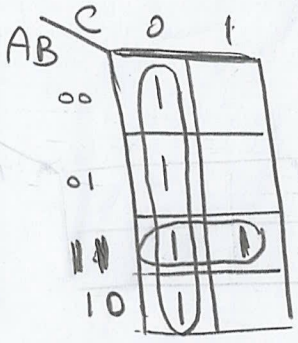
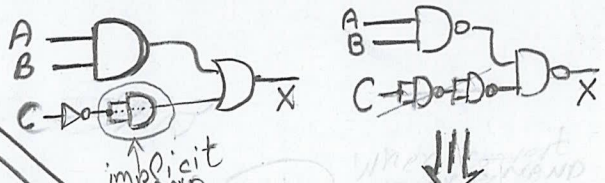
A	B	C	X
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

To get SOP ⇒

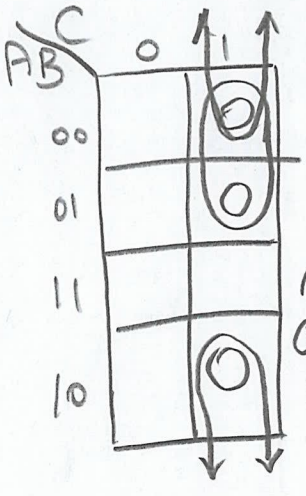


$$X = \overline{C} + AB$$

AND-OR NAND

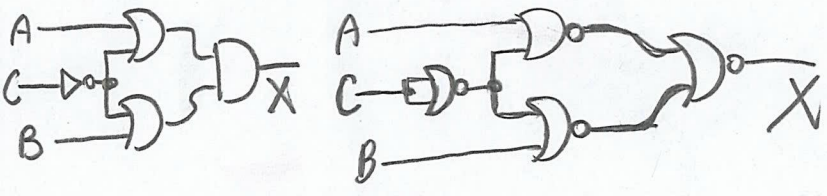


To get POS ⇓

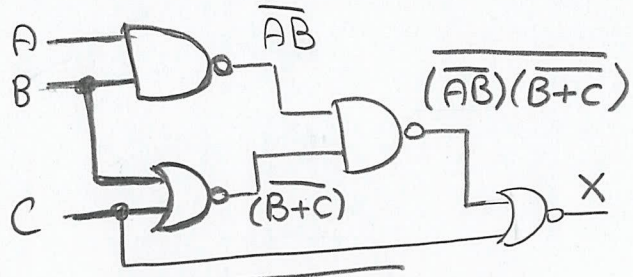


$$X = (\overline{C}+A)(\overline{C}+B)$$

AND-OR NOR



21 & 23



$$\Rightarrow X = \overline{\left(\overline{(\overline{AB})(B+C)} + C\right)}$$

$$X = \overline{(\overline{AB})(B+C)}\,\overline{C}$$

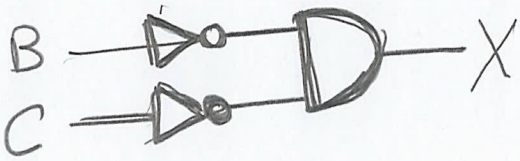
$$= \overline{AB}\,(B+C)\,\overline{C}$$

$$= (\overline{A}+\overline{B})\,\overline{B}\,\overline{C}\,\overline{C}$$

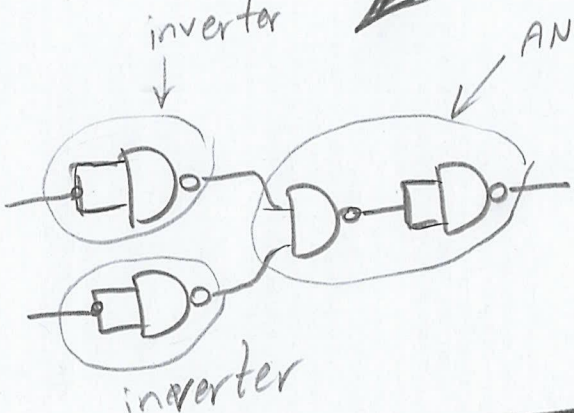
$$= \overline{A}\,\overline{B}\,\overline{C} + \overline{B}\,\overline{B}\,\overline{C}$$

$$= (\overline{A}+1)\,\overline{B}\,\overline{C}$$

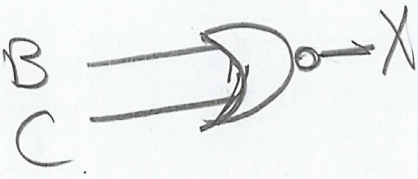
$$= \overline{B}\,\overline{C}$$



NAND



NOR



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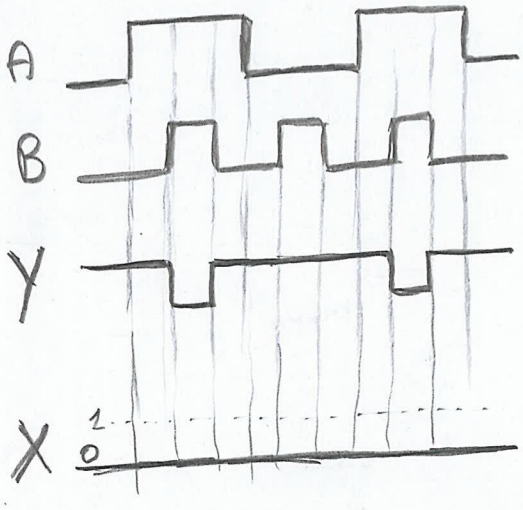

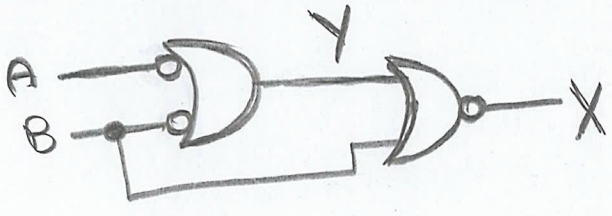

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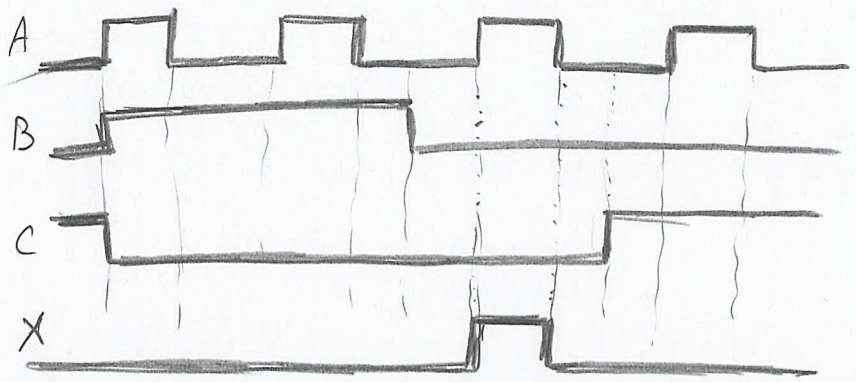
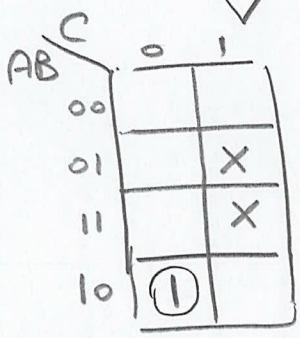
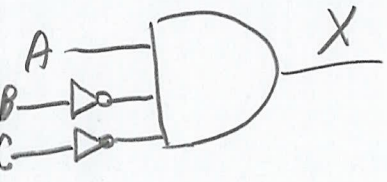


A	B	C	X
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	X
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	X



$X = A\bar{B}\bar{C}$



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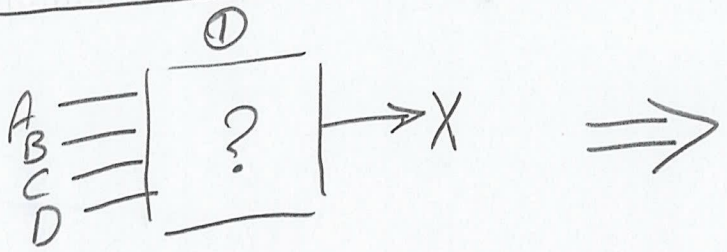
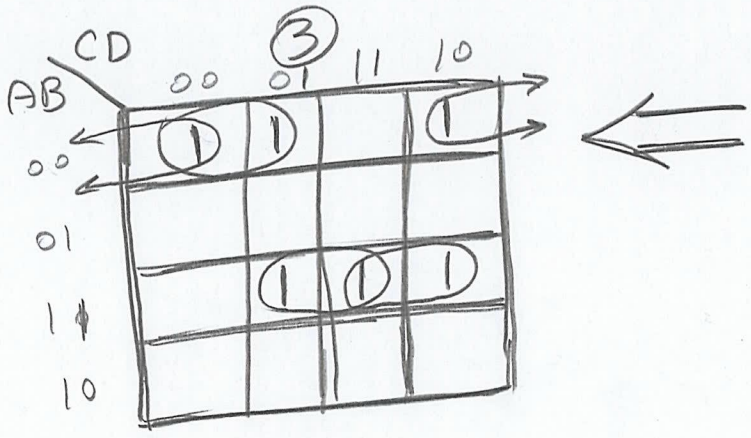


②

A	B	C	D	X
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

<3

>12



④

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

⑤