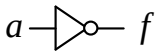
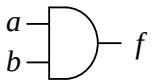
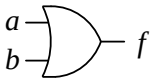
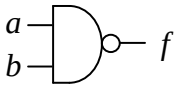
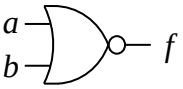
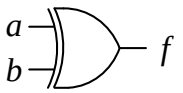
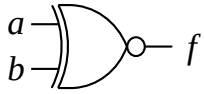
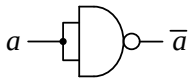
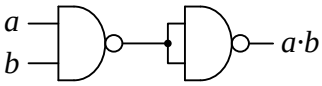
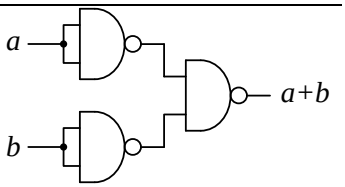
Laborator 1 – Porti logice

	Simbol	Operatia Logica	Tabel de adevar
Inversor		$f = \overline{a}$	$\begin{array}{c\|c} a & f \\ \hline 0 & 1 \\ 1 & 0 \end{array}$
AND		$f = a \cdot b$	$\begin{array}{cc\|c} a & b & f \\ \hline 0 & 0 & 0 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \\ 1 & 1 & 1 \end{array}$
OR		$f = a + b$	$\begin{array}{cc\|c} a & b & f \\ \hline 0 & 0 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 1 \end{array}$

	Simbol	Operatia Logica	Tabel de adevar
NAND		$f = \overline{a \cdot b}$	$\begin{array}{cc\|c} a & b & f \\ \hline 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \\ 1 & 1 & 0 \end{array}$
NOR		$f = \overline{a + b}$	$\begin{array}{cc\|c} a & b & f \\ \hline 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \\ 1 & 1 & 0 \end{array}$
XOR		$f = a \oplus b$	$\begin{array}{cc\|c} a & b & f \\ \hline 0 & 0 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{array}$

XNOR		$f = a \otimes b = \overline{a \oplus b}$	a b | f 0 0 | 1 0 1 | 0 1 0 | 0 1 1 | 1

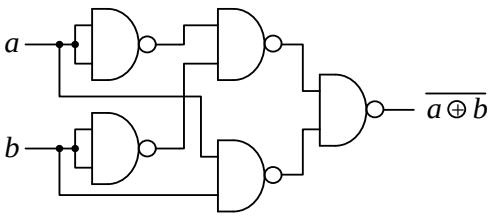
Orice poarta elementara se poate implementa cu poarta NAND cu doua intrari, dupa cum sunt aratate cateva exemple mai jos:

NOT	AND	OR
$\overline{a} = \overline{a \cdot a}$	$ab = \overline{\overline{a \cdot b}}$	$a + b = \overline{\overline{a} \cdot \overline{b}}$
		

1. Sa se verifice functionarea portilor elementare.
2. Sa se implementeze functia f_1 cu porti elementare:

$$f_1 = ab + bc + ac$$

3. Sa se realizeze o poarta OR din porti NAND cu 2 intrari.
4. Sa se realizeze o poarta XOR din porti NAND cu 2 intrari.



Se vor folosi circuitele integrate:
4001, 4011, 4071, 4081, 4023, 4025, 4073, 4075, 4002, 4012, 4070