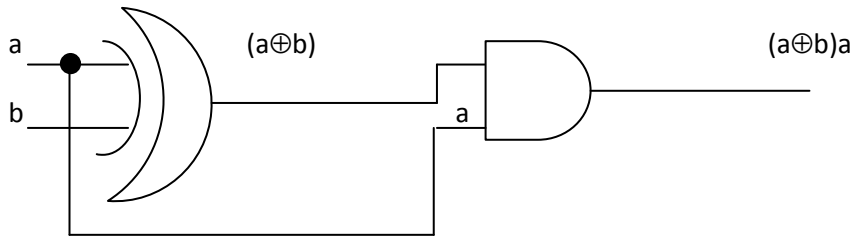


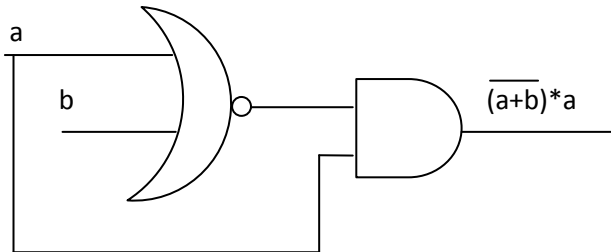
Exercice de logique

1. Simplifier les équations suivantes :

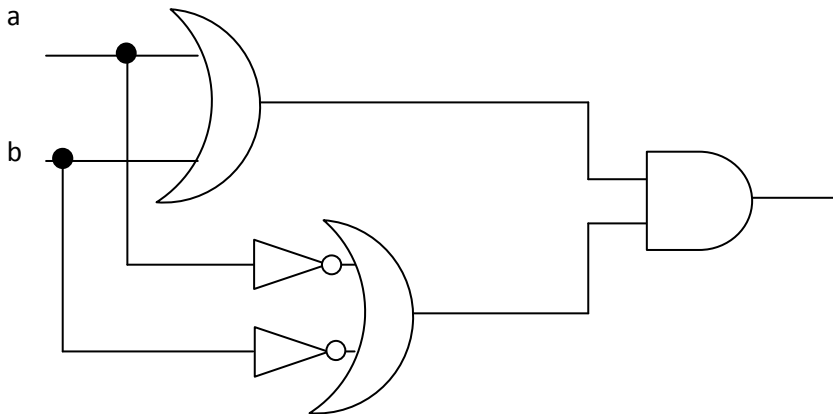
- $(a \oplus b)a$



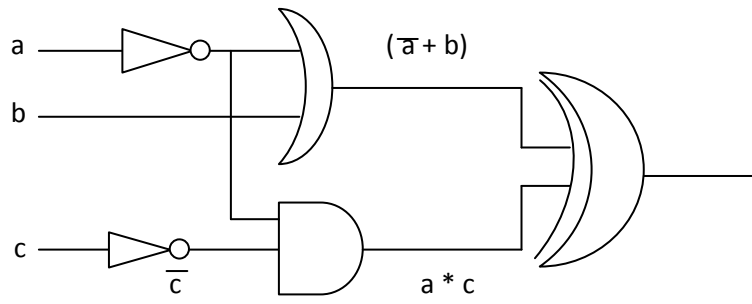
- $\overline{(a+b)} * a$



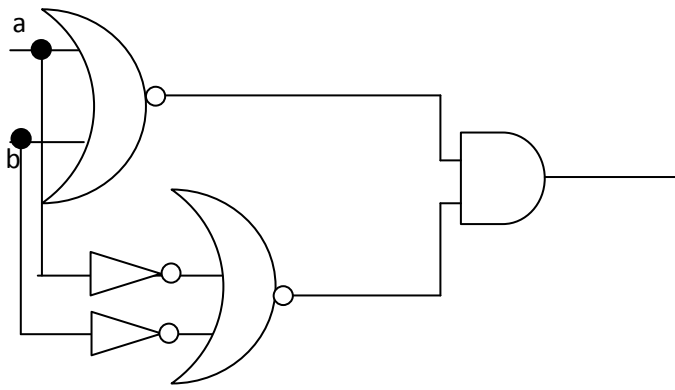
- $(a+b) * (\overline{a+b})$



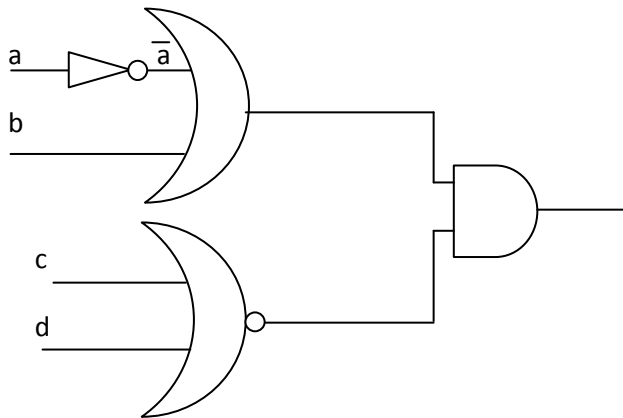
- $(\bar{a} + b) \oplus \bar{a} * \bar{c}$



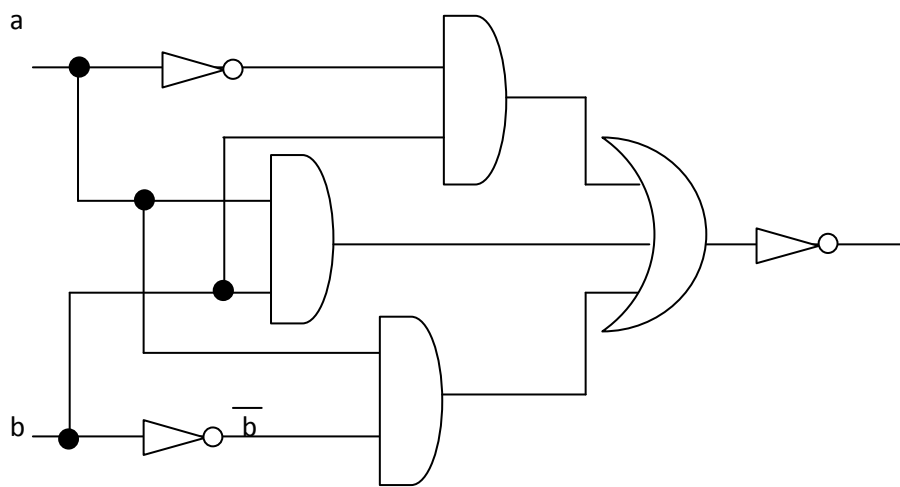
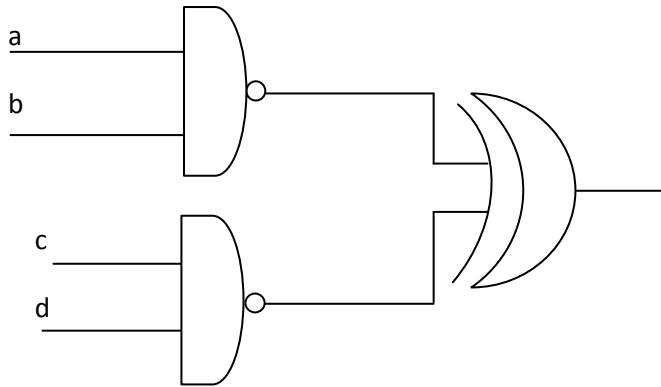
- $\overline{(\bar{a} + \bar{b})} * (\bar{a} + b)$



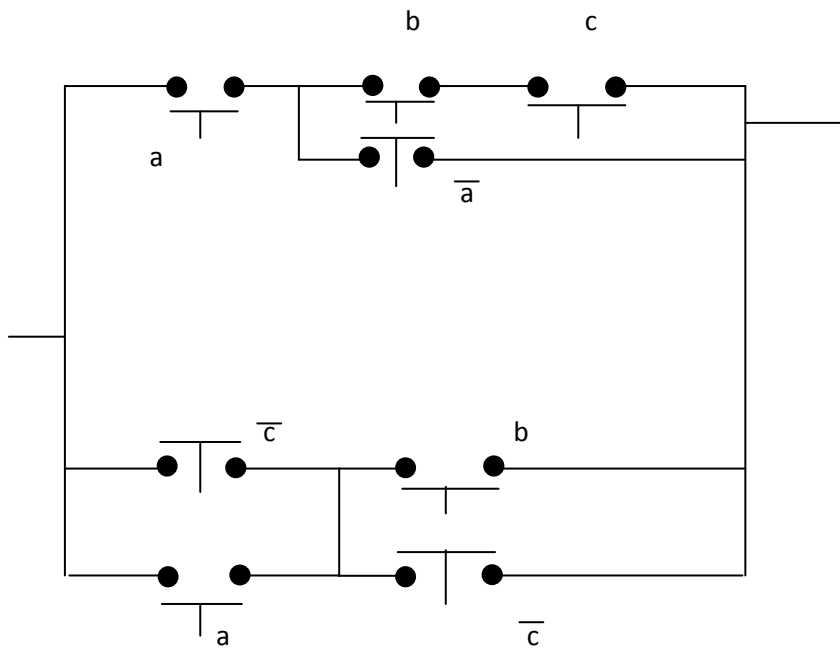
- $(\bar{a} + b) * (\bar{c} + d)$



- $\overline{(a * b)} \oplus \overline{(c * d)}$



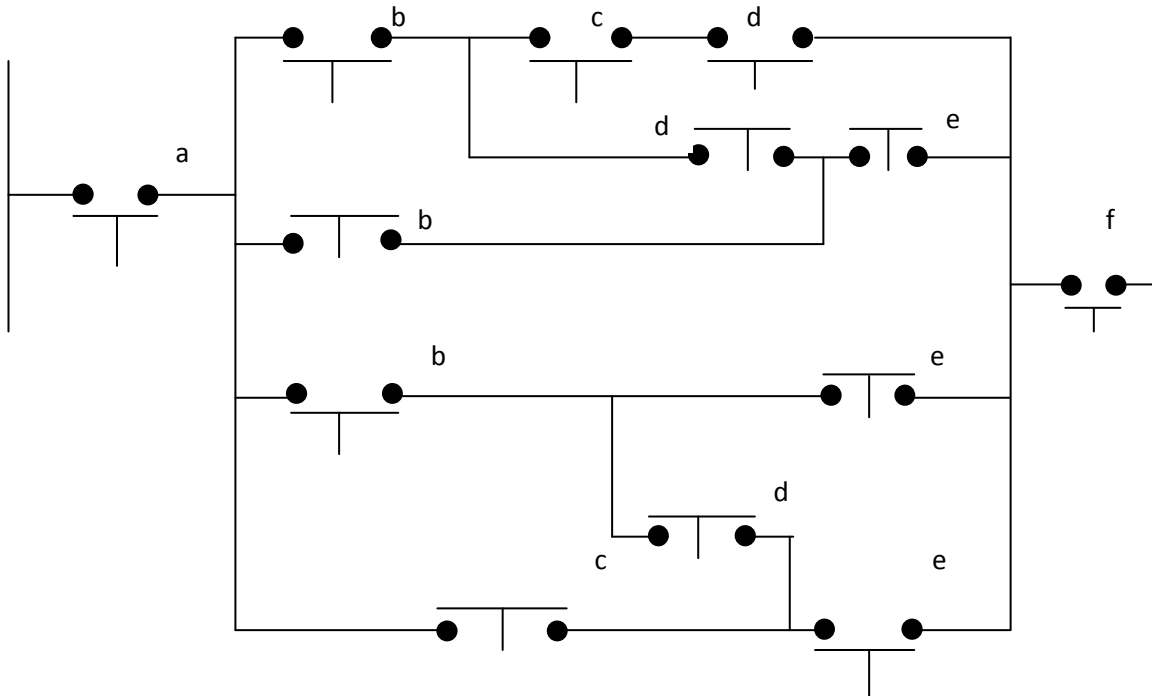
Rep : $\overline{(\bar{a} * b) + (a * b) + (a * \bar{b})}$



Rep : $(a * b * c) + (a * \bar{a}) + (\bar{c} * b) + (\bar{c} * \bar{c}) + (a * \bar{c}) + (a * b)$

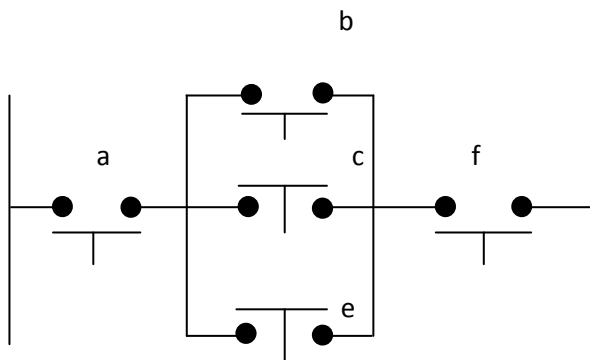
2. Exercices postulat et théorème :

Soit le schéma électrique suivant :



- Donner la représentation algébrique du schéma électrique
- Simplifier l'équation en vous basant sur les postulats et théorèmes
- Fournir le schéma électrique correspondant à l'équation simplifiée.

$$= bcd + b\bar{d}e + \bar{b}c\bar{d} + \bar{b}e + \bar{b}e + b\bar{d}e + \bar{c}e + c\bar{d}e$$



Simplifier les équations suivantes :

$$\begin{aligned} 1) & (a \oplus b) * a \\ & = (\bar{a} * b + a * \bar{b}) * a \\ & = \bar{a}ab + a\bar{b}a \\ & = \bar{a}b \end{aligned}$$

le OU exclusif
distribution
 $\bar{a} * a = 0 ; a * a = a$

$$\begin{aligned} 2) & (\overline{a + b}) * a \\ & = (\bar{a} * \bar{b}) * a \\ & = (\bar{a}a) * \bar{b} = 0 \end{aligned}$$

Loi de De Morgan
distribution
 $\bar{a} * a = 0$

$$\begin{aligned} 3) & (a + b) * (\bar{a} + \bar{b}) \\ & = (a * \bar{a} + b * \bar{a}) + (a * \bar{b} + \bar{b} * b) \\ & = \bar{b}a + \bar{b} \end{aligned}$$

distribution
 $\bar{a} * a = 0 ; \bar{b} * b = 0$

$$\begin{aligned} 4) & (\bar{a} + b) \oplus \bar{a} * \bar{c} \\ & = (\overline{\bar{a} + b}) * (\bar{a} * \bar{c}) + (\bar{a} + b) * (\overline{\bar{a} * \bar{c}}) \\ & = (a * \bar{b}) * \bar{a} * \bar{c} + (\bar{a} + b) * (a + c) \\ & = \bar{a} * a + \bar{a} * c + b * a + b * c \\ & = \bar{a} * c + b * a + b * c \end{aligned}$$

le OU exclusif
loi d'involution
 $\bar{a} * a = 0$