

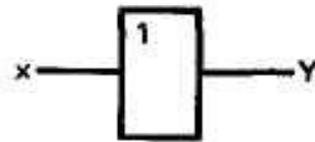
# **Лекция № 13 Синтез комбинированных схем в заданном базисе.**

## **Учебные вопросы**

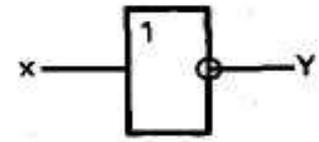
- 1. Основные определения**
- 2. Функциональная полнота базиса**
- 3. Синтез комбинационной схемы на логических элементах малой степени интеграции**
- 4. Синтез комбинационной схемы на логических элементах средней и большой степени интеграции**

# Элементы, реализующие логические функции

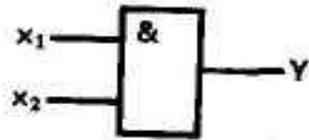
Повторитель  
 $Y = x$



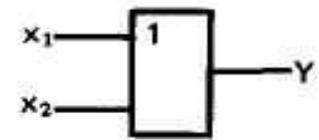
Инвертор (НЕ)  
 $Y = \bar{x}$



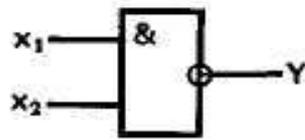
Конъюнктор (И)  
 $Y = x_1 \cdot x_2$



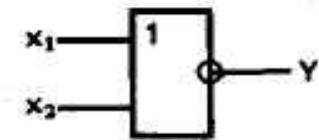
Дизъюнктор (ИЛИ)  
 $Y = x_1 \vee x_2$



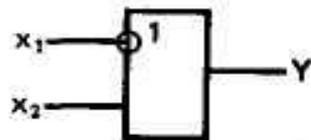
Элемент Шеффера (И-НЕ)  
 $Y = \overline{(x_1 \cdot x_2)} = x_1 | x_2$



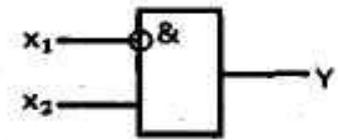
Элемент Пирса (ИЛИ-НЕ)  
 $Y = \overline{(x_1 \vee x_2)} = x_1 | x_2$



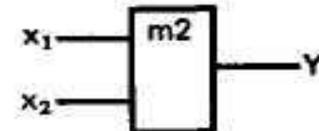
Импликатор  
 $Y = \bar{x}_1 \vee x_2 = x_1 \rightarrow x_2$



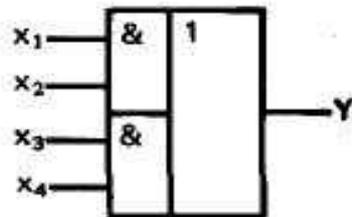
Запрет  
 $Y = \bar{x}_1 \cdot x_2 = x_2 \Delta x_1$



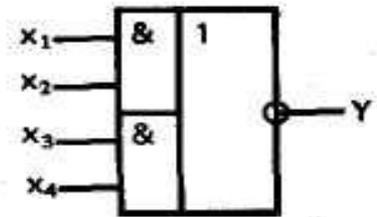
Сложение по модулю 2  
 $Y = x_1 \cdot \bar{x}_2 \vee \bar{x}_1 \cdot x_2 = x_1 \oplus x_2$



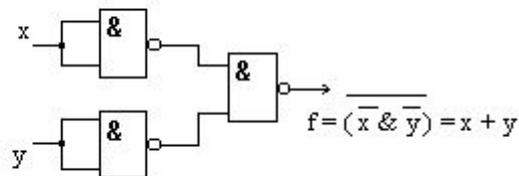
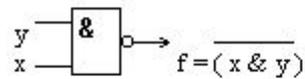
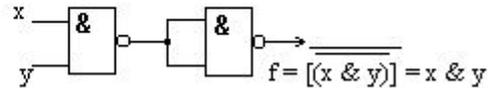
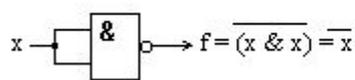
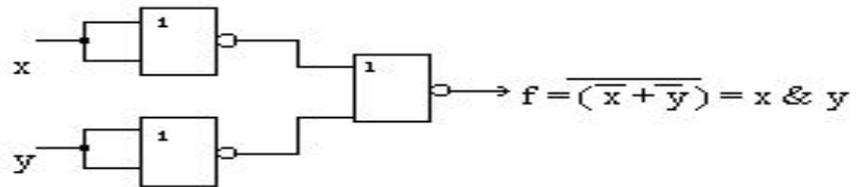
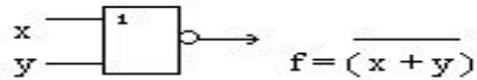
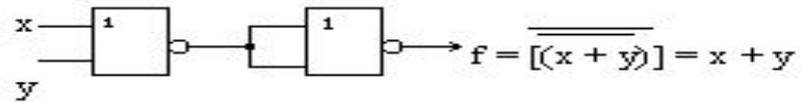
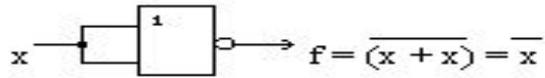
И-ИЛИ  
 $Y = x_1 \cdot x_2 \vee x_3 \cdot x_4$



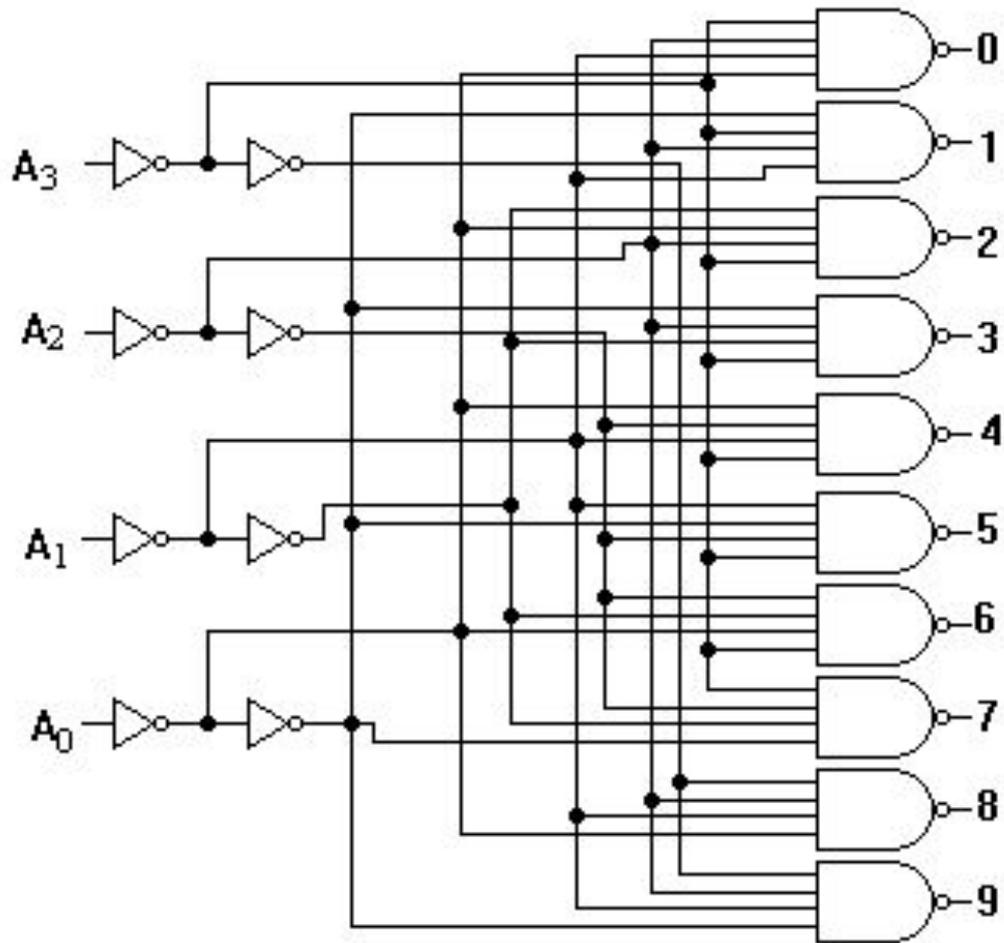
И-ИЛИ-НЕ  
 $Y = \overline{(x_1 \cdot x_2 \vee x_3 \cdot x_4)}$



# Универсальность



|   | abcd | <b>0123456789</b> |
|---|------|-------------------|
| 0 | 1111 | 1000000000        |
| 1 | 0001 | 0100000000        |
| 2 | 0010 | 0010000000        |
| 3 | 0011 | 0001000000        |
| 4 | 0100 | 0000100000        |
| 5 | 0101 | 0000010000        |
| 6 | 0110 | 0000001000        |
| 7 | 0111 | 0000000100        |
| 8 | 1000 | 0000000010        |
| 9 | 1001 | 0000000001        |



$A_3=a$     $A_2=b$     $A_1=c$     $A_0=d$