

# Lab nr 30

## Flip flops and sequential circuits

### Goals

To study the behavior of flip flops and basic sequential circuits including shift registers.

### 1 Experiment

1.1 Construct circuit 1a and 1b (Fig. 1) using trainer board UNILOG-2. Measure and record the truth tables for your report.

1.2 Using 7400, 7402, 7404 ICs in UNILOG-2 build clocked flip-flops presented in Fig. 2. Measure and record the truth tables for your report.

1.3 Build the shift register shown in Fig. 3. Check the operation of the circuit.

1.4. Present working circuits to your supervisor for acceptance.

### 2 Background

2.1 Logic gates.

2.2 Combination and sequential logic circuits.

2.3 RS flip-flops and synchronous RS flip-flops.

2.5 D and JK flip-flops.

2.6 Registers.

### Literature

[1] P. Horowitz, W. Hill *Sztuka elektroniki* WKŁ 1995.

[2] A. Niederliński *Mikroprocesory, mikrokomputery, mikrosystemy*. WSP 1987.

[3] J. Pieńkos, J. Turczyński *Układy scalone TTL w systemach cyfrowych*. WKŁ 1986.

[4] W. Kasiński *Doświadczenia z podstaw techniki cyfrowej*. Wrocław 1988.

[5] Internet.

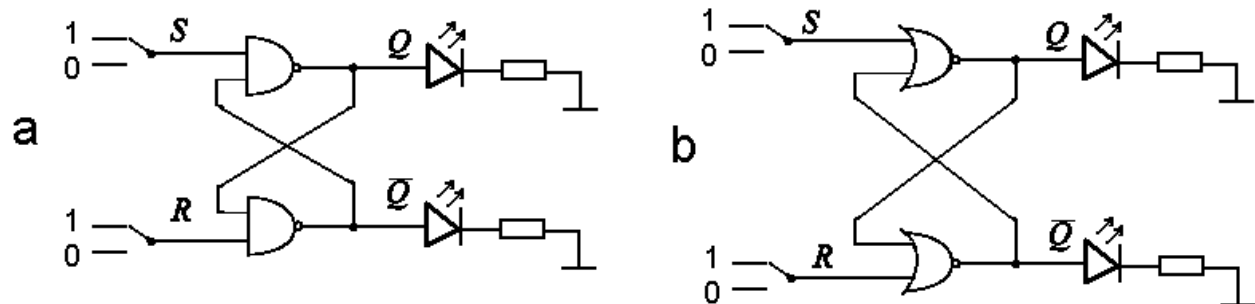


Fig. 1. R-S latches.

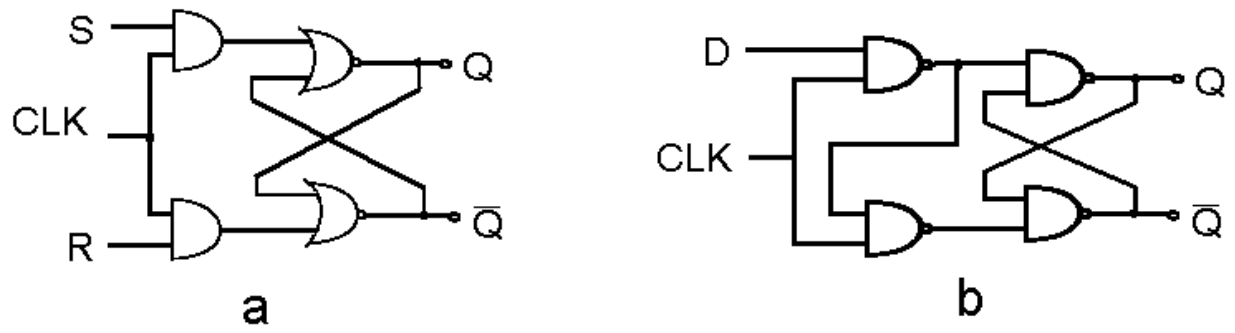


Fig. 2. Clocked flipflops.

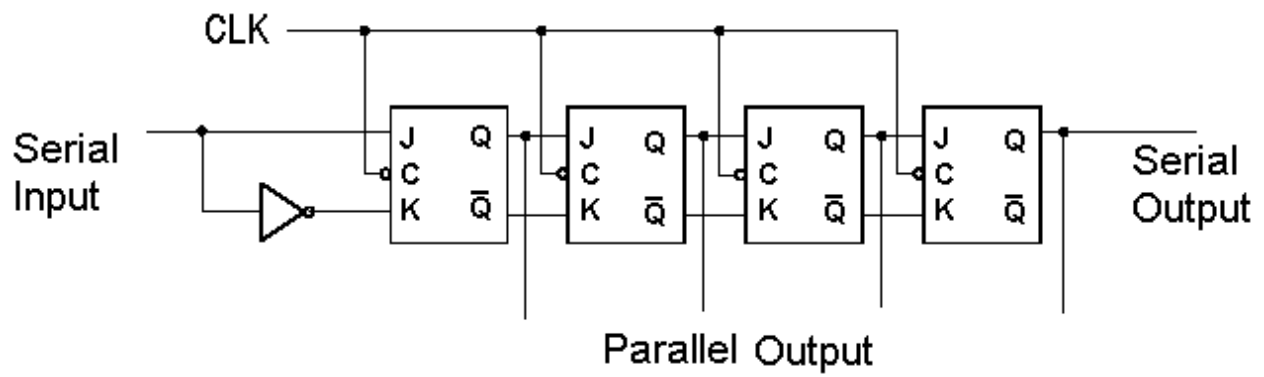


Fig. 3