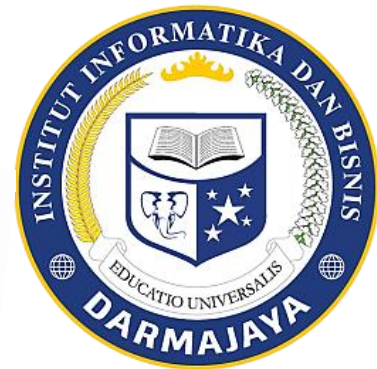


Modul Praktikum

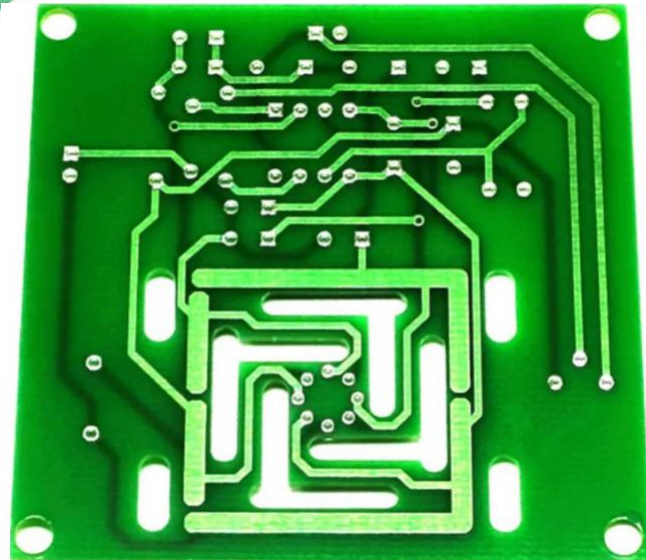
DESAIN DAN SIMULASI RANGKAIAN ELEKTRONIKA

Kode Matakuliah: SKO21425



Penyusun:

Bayu Nugroho. S.Kom., M.Eng



**PROGRAM STUDI SISTEM KOMPUTER
FAKULTAS ILMU KOMPUTER
INSTITUT INFORMATIKA DAN BISNIS DARMAJAYA
2023**

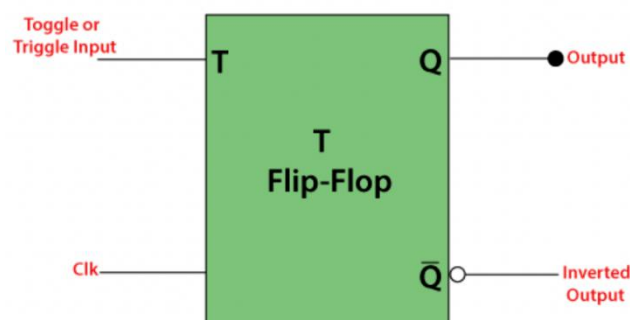
Modul 9

T Flip Flop

1. T Flip Flop

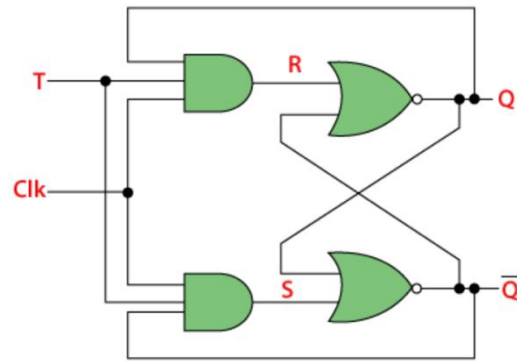
In T flip flop, "T" defines the term "Toggle". In SR Flip Flop, we provide only a single input called "Toggle" or "Trigger" input to avoid an intermediate state occurrence. Now, this flip-flop work as a Toggle switch. The next output state is changed with the complement of the present state output. This process is known as "Toggling".

We can construct the "T Flip Flop" by making changes in the "JK Flip Flop". The "T Flip Flop" has only one input, which is constructed by connecting the input of JK flip flop. This single input is called T. In simple words, we can construct the "T Flip Flop" by converting a "JK Flip Flop". Sometimes the "T Flip Flop" is referred to as single input "JK Flip Flop". Block diagram of the "T-Flip Flop" is given where T defines the "Toggle input", and CLK defines the clock signal input

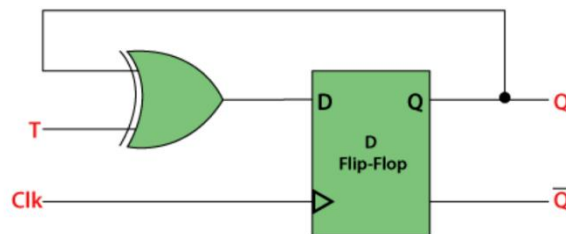


2. Construction

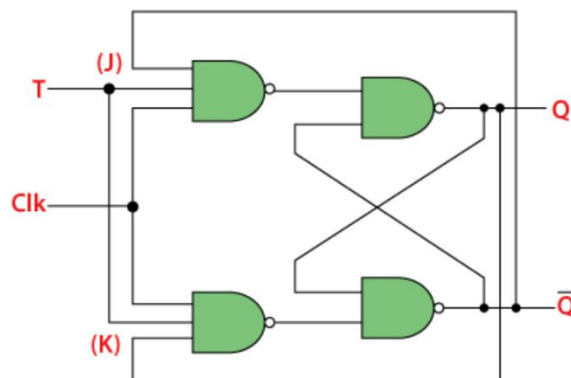
The "T Flip Flop" is designed by passing the AND gate's output as input to the NOR gate of the "SR Flip Flop". The inputs of the "AND" gates, the present output state Q, and its complement Q' are sent back to each AND gate. The toggle input is passed to the AND gates as input. These gates are connected to the Clock (CLK) signal. In the "T Flip Flop", a pulse train of narrow triggers are passed as the toggle input, which changes the flip flop's output state. The circuit diagram of the "T Flip Flop" using "SR Flip Flop" is given below:



The "T Flip Flop" is formed using the "D Flip Flop". In D flip - flop, the output after performing the XOR operation of the T input with the output "QPREV" is passed as the D input. The logical circuit of the "T-Flip Flop" using the "D Flip Flop" is given below:



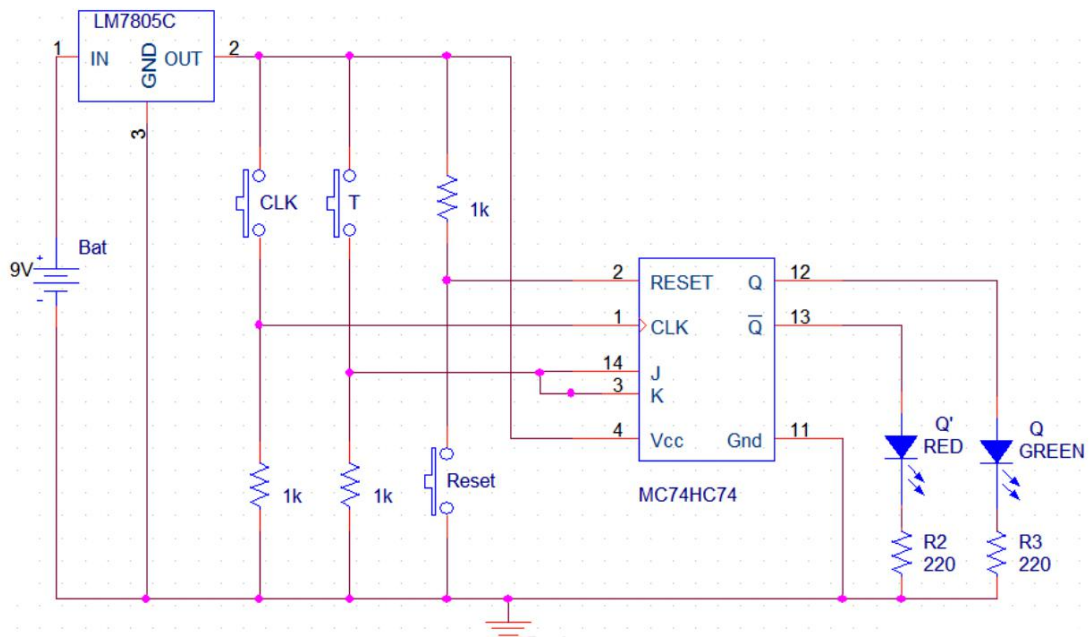
The simplest construction of a D Flip Flop is with JK Flip Flop. Both the inputs of the "JK Flip Flop" are connected as a single input T. Below is the logical circuit of the T Flip Flop" which is formed from the "JK Flip Flop":



JOBSHEET 9

Lakukan Simulasi T Flip Flop menggunakan software simulator seperti pada gambar skema di bawah ini dan jelaskan tahapan perakitan dan hasil simulasinya.

T FLIP FLOP CIRCUIT USING 74HC74



LAPORAN HASIL PERCOBAAN: