Khulna University of Engineering & Technology (KUET)

Department of Computer Science and Engineering

Course Code: CSE 4224

Course Title: Digital System Design Laboratory

Lab Report

Name of the experiment: Designing three-tri state buffer register.

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Objectives:

The main objectives of this experiment are stated below:

- to know about three-state buffere registere.
- to know how to implement this registere.
- to learn about registere and bus connection.
- to implement a 4-bit registeres and bus connection to data transfer.

Introduction:

In digital electronics, three-state, tri-state or 3-state logic allows an output or input pin/pad to assume a high impedance state, effectively removing the output from the circuit, in addition to the 0 and 1 logic levels.

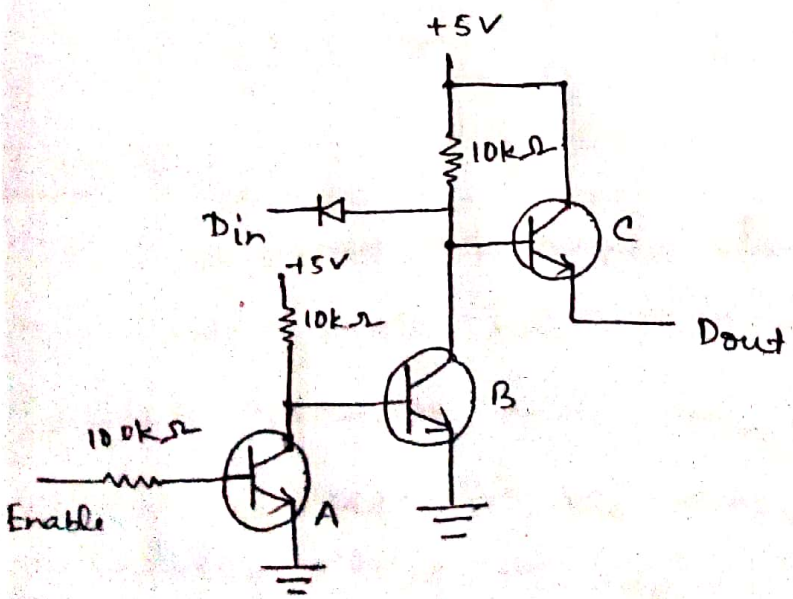
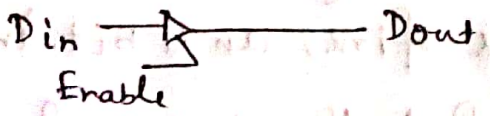


Fig-1: Three-state switch.

The truth table for normally open three-state switch is given below:

Enable	Din	Dout
0	X	Open
1	0	0
1	1	1



The main application of three-state switches is to convert the two-state output of a register to a three-state output. The diagram of the three-state buffer register is given in the next page:

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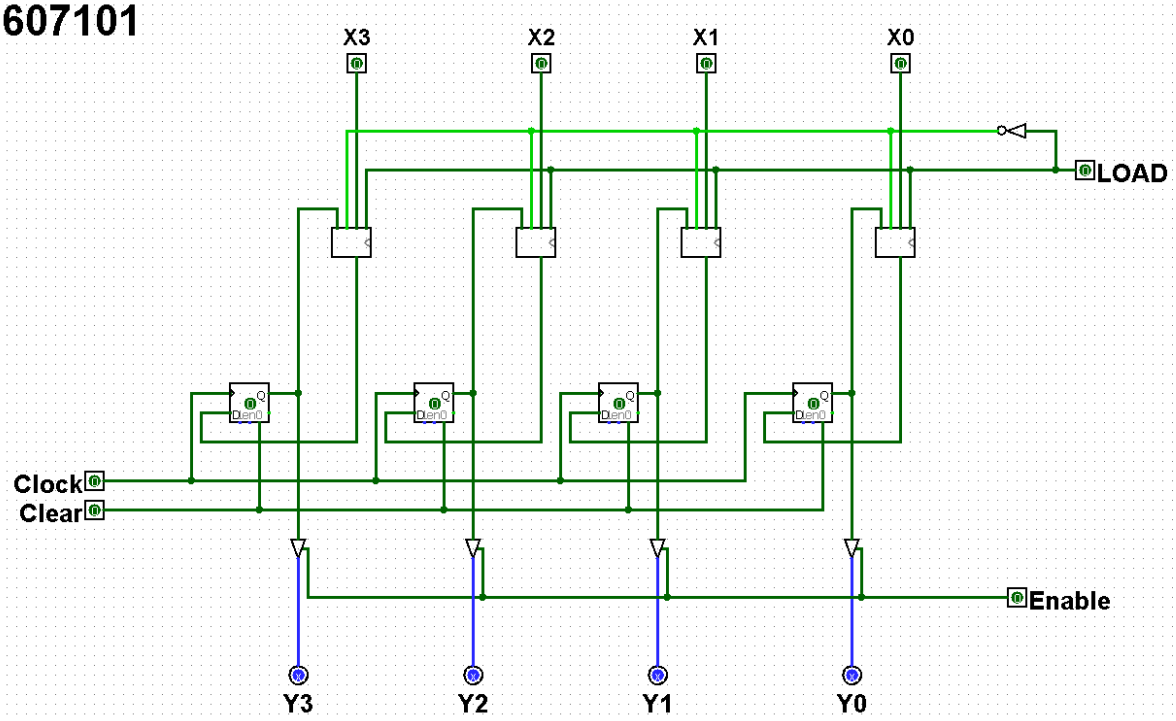

Fig. 2: Buffer Register

Working procedure:

At first, the three-state buffere register and is implemented and the input-outputs were checked.

Then the bus connection was implemented with 4 registers having 4-bit input-output. To check if it worked fine, an 4 bit input was taken and connected to the bus and the data were loaded into the register A1.

The circuit diagram of bus connection with 4 three-state registers is given below:

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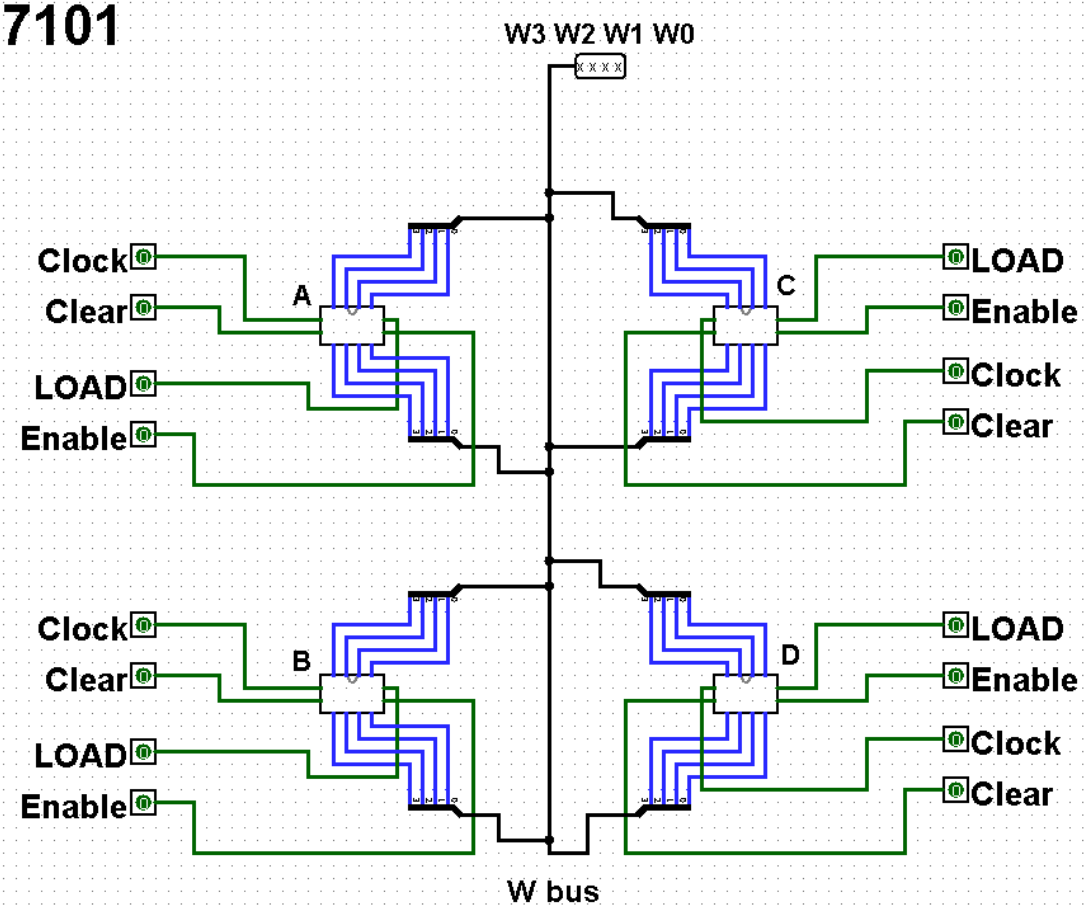

Fig. 3: Bus connection of buffer register

Discussion:

At first, all the registers were loaded with 0000. Then $(0101)_2$ was given to register A and then this value was loaded to register B. Then $(0011)_2$ was loaded to register C. Thus the whole experiment was carried out successfully.

Conclusion:

We have learnt that how three-state buffer register works and can be implemented. Then we have connected bus to the registers and transferred the data.

References:

- "Digital Logic and Computer Design" by M. Morris Mano.