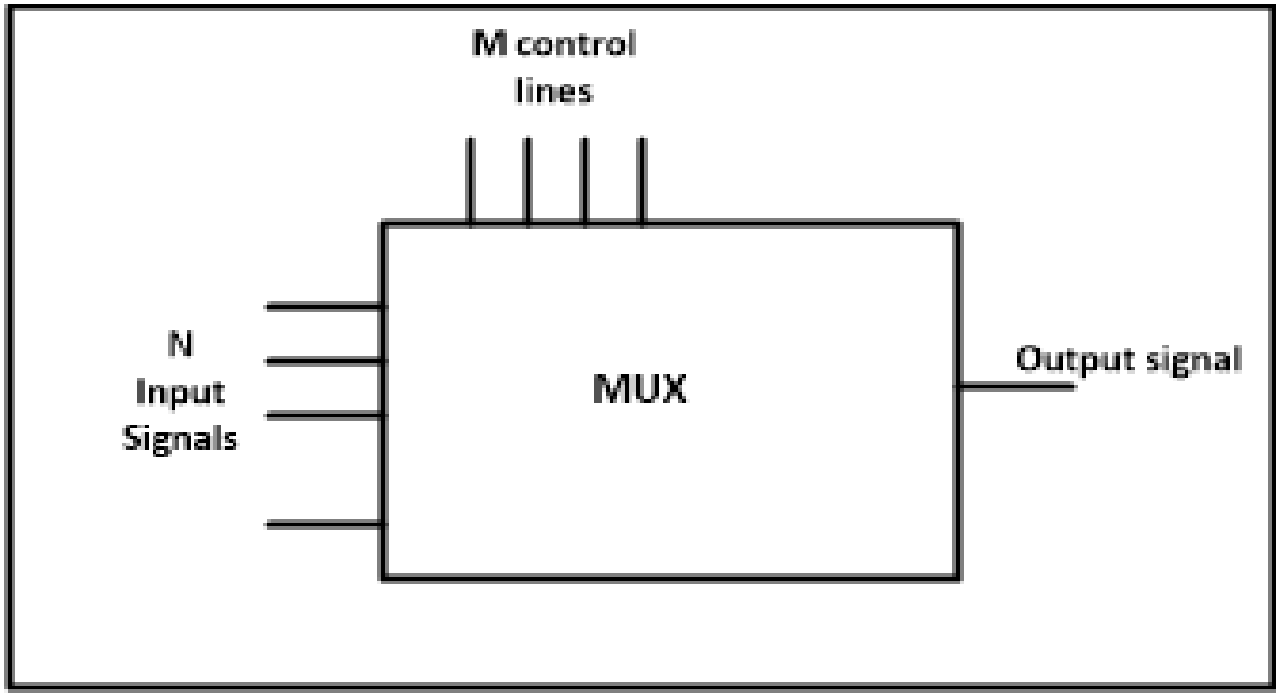
MULTIPLEXER (MUX)

What is multiplexer?

- Multiplexer means many into one
- A multiplexer is a circuit used to select and route any one of the several input signals to a signal output

Example:

A simple example of an non electronic circuit of a multiplexer is a single pole multiposition switch

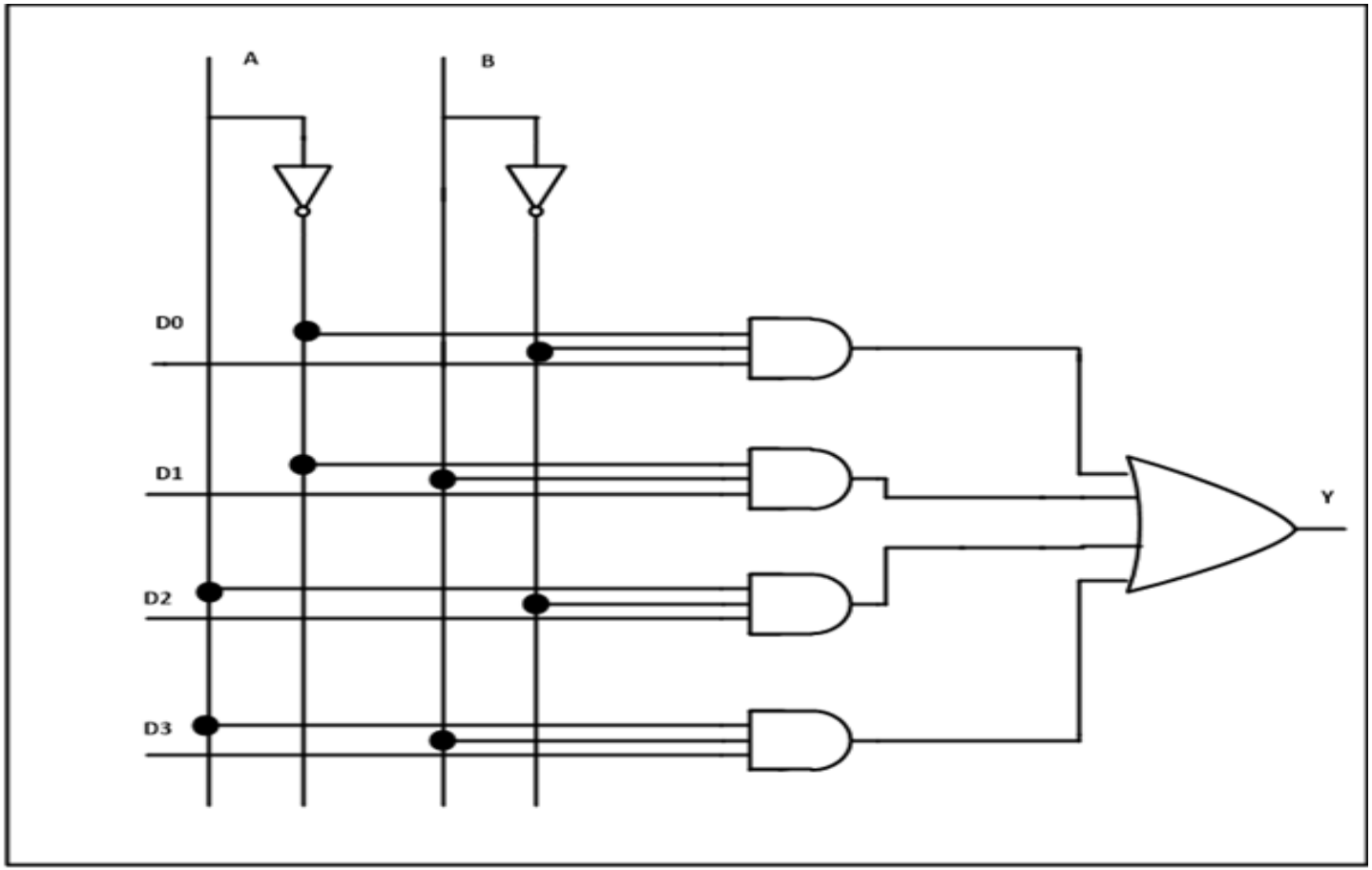


Pin Diagram - MUX

Understanding 4-to-1 Multiplexer:

- The 4-to-1 multiplexer has 4 input bit, 2 control bits, and 1 output bit.
- The four input bits are D0,D1,D2 and D3.
- only one of this is transmitted to the output y.
- The output depends on the value of AB which is the control input.
- The control input determines which of the input data bit is transmitted to the output.

- For instance, as shown in fig. when AB = 00, the upper AND gate is enabled while all other AND gates are disabled.
- Therefore, data bit D0 is transmitted to the output, giving Y = Do.



4 to 1 Multiplexer Circuit Diagram

- If the control input is changed to AB =11, all gates are disabled except the bottom AND gate. In this case, D3 is transmitted to the output and Y = D3.

- An example of 4-to-1 multiplexer is IC 74153 in which the output is same as the input.
- Another example of 4-to-1 multiplexer is 45352 in which the output is the compliment of the input.
- Example of 16-to-1 line multiplexer is IC74150.

Applications of Multiplexer:

Multiplexer are used in various fields where multiple data need to be transmitted using a single line.

Following are some of the applications of multiplexers –

- Communication system
- Telephone network
- Computer memory
- Transmission from the computer system of a satellite

Communication system –

Communication system is a set of system that enable communication like transmission system, relay and tributary station, and communication network. The efficiency of communication system can be increased considerably using multiplexer. Multiplexer allow the process of transmitting different type of data such as audio, video at the same time using a single transmission line.

Telephone network –

In telephone network, multiple audio signals are integrated on a single line for transmission with the help of multiplexers. In this way, multiple audio signals can be isolated and eventually, the desire audio signals reach the intended recipients.

Computer memory –
Multiplexers are used to implement huge amount of memory into the computer, at the same time reduces the number of copper lines required to connect the memory to other parts of the computer circuit.

Transmission from the computer system of a satellite –
Multiplexer can be used for the transmission of data signals from the computer system of a satellite or spacecraft to the ground system using the GPS (Global Positioning System) satellites

THANK YOU