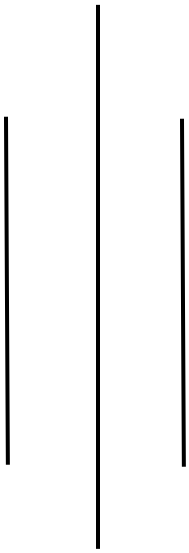
SHAID SMARAK COLLEGE

Kirtipur, Kathmandu



Lab no: 5 of Digital logics

Submitted by :-

1st semester

Amir Maharjan

Submitted to :-

Himal Raj Gental

LAB 4: DECODER

Objective:

- To understand the concept of encoder.
- To learn how to implement encoder.

Discussion:

In general, an encoder is a device or process that converts data from one format to another. In position sensing, an encoder is a device which can detect and convert mechanical motion to an analog or digital encoded output signals.

Encoder:

It is a digital circuit that performs the inverse operation of a decoder. It has 2^n input lines and n output lines. The output lines generate the binary code corresponding to the input value. An example is the octal-to-binary encoder which has eight inputs, one for each of the octal inputs, and 3 outputs that generate the corresponding binary number. This is the exact opposite of 3-to-8-line decoder.

Y^7	Y^6	Y^5	Y^4	Y^3	Y^2	Y^1	Y^0	A^2	A^1	A^0
0	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
0	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**
0	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**
0	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**
0	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
0	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**
0	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**
1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**

0Table: *Truth table of 8 to 3 encoder.*

The 8 to 3 encoder or octal to binary encoder consists of 8 inputs i.e. Y7 to Y0 and 3 inputs i.e. A2 to A0. Each input line corresponds to each octal digit and three outputs generate corresponding binary code. The logical expressions of A2, A1, and A0 are as:

A2: Y7 + Y6 + Y5 + Y4

A1: Y7 + Y6 + Y3 + Y2

A0: Y7 + Y5 + Y3 + Y1

 # Example: - 8-to3-line encoder

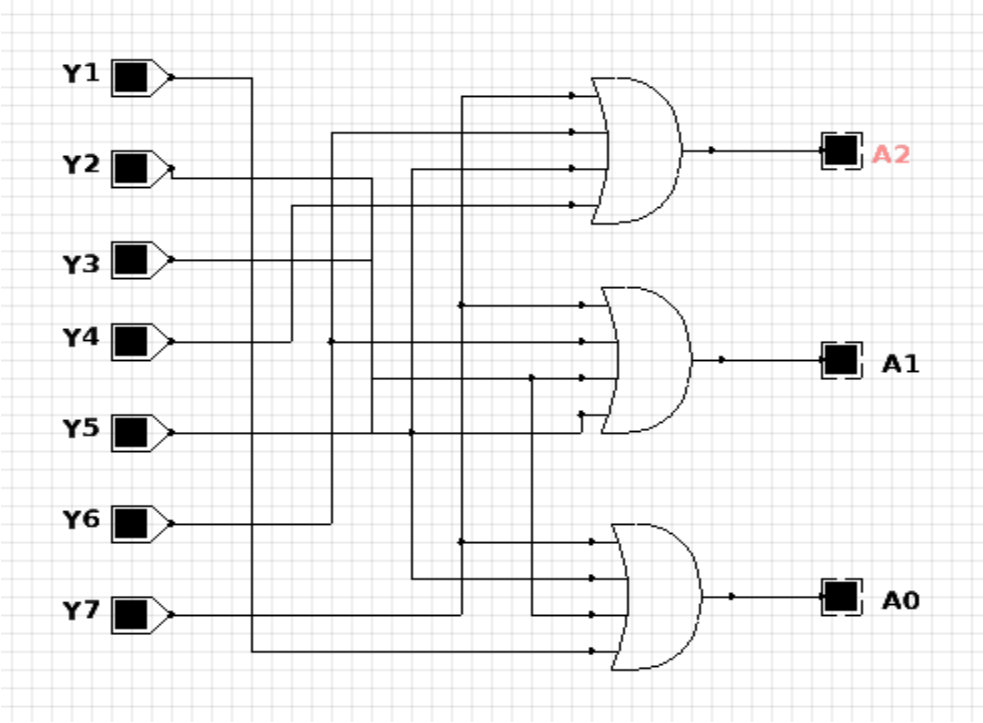


Fig: 8-to-3-line Encoder

Fig: Implementation of 8-to-3-line encoder.

The implementation of 8-to-3-line encoder is not much different than 3-to-8-line decoder, the only difference between the two is encoder has 8 inputs, 3 outputs and decoder has 3 inputs and 8 outputs. Therefore, encoder and decoder are vice versa.