

Title:**Design and implement encoder and decoder using logic gates****Objectives:**

- To understand the concepts of encoders and decoders in digital logic circuits.
- To design and implement a 4-to-2 binary encoder using logic gates.
- To design and implement a 2-to-4 binary decoder using logic gates.
- To verify the functionality of the encoder and decoder using truth tables and simulations.

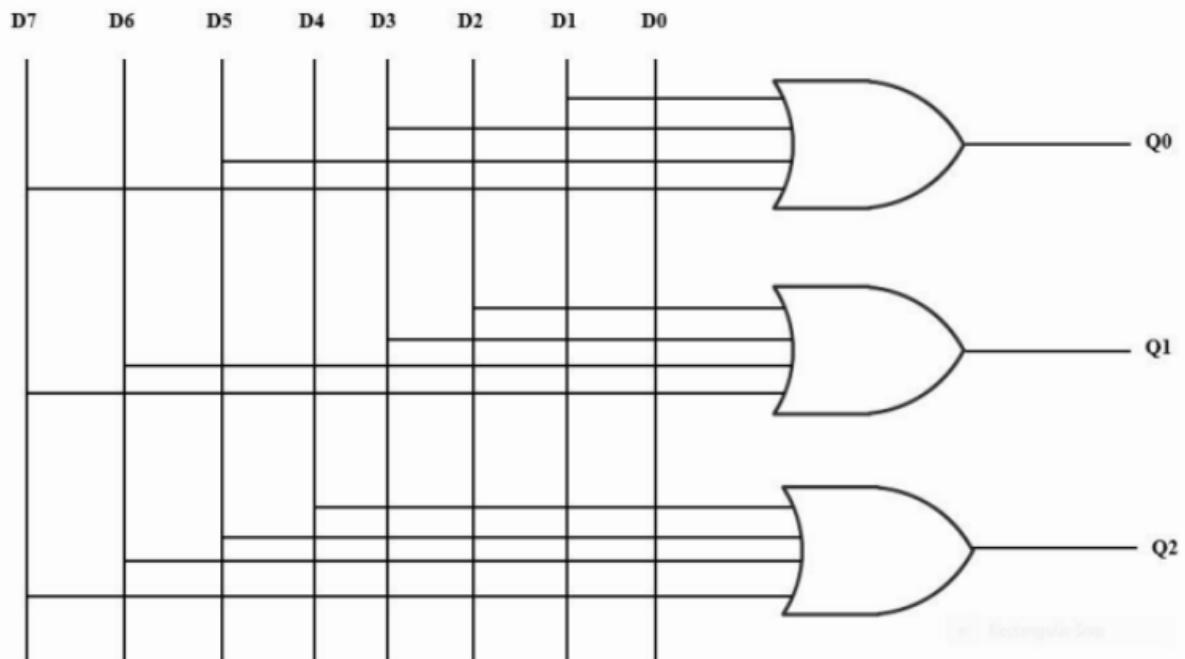
Equipment:

- Power supply
- Connecting wires
- Logic gates (AND, OR, NOT)
- Breadboard

Truth-Table of Encoder:

INPUTS								OUTPUTS		
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

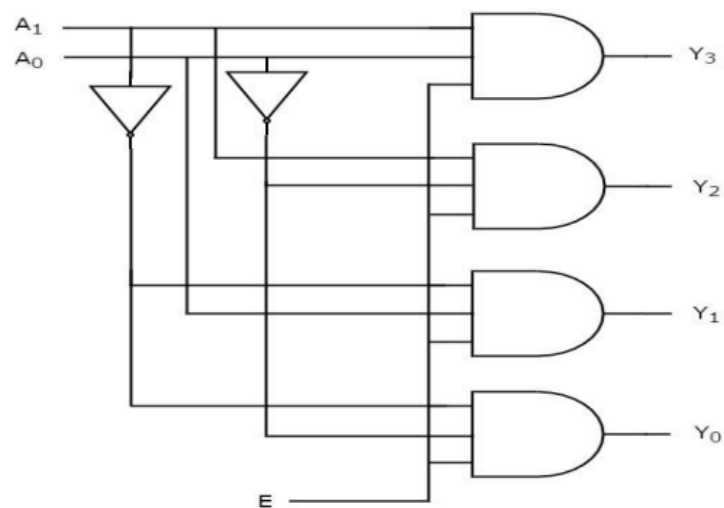
Logic Diagram of Encoder:



Truth-Table of Decoder:

Inputs			Outputs			
E	A ₁	A ₀	Y ₀	Y ₁	Y ₂	Y ₃
1	0	0	1	0	0	0
1	0	1	0	1	0	0
1	1	0	0	0	1	0
1	1	1	0	0	0	1

Logic Diagram of Decoder:



Conclusion:

Encoders and decoders are essential components in digital communication systems. They play a crucial role in converting information between different formats. By designing and implementing a 4-to-2 binary encoder and a 2-to-4 binary decoder, we have gained a deeper understanding of these fundamental digital logic circuits.