



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++'(III Cycle) Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

23ECB201 – DIGITAL SYSTEMS DESIGN

II YEAR/ III SEMESTER

UNIT 2 – COMBINATIONAL CIRCUITS

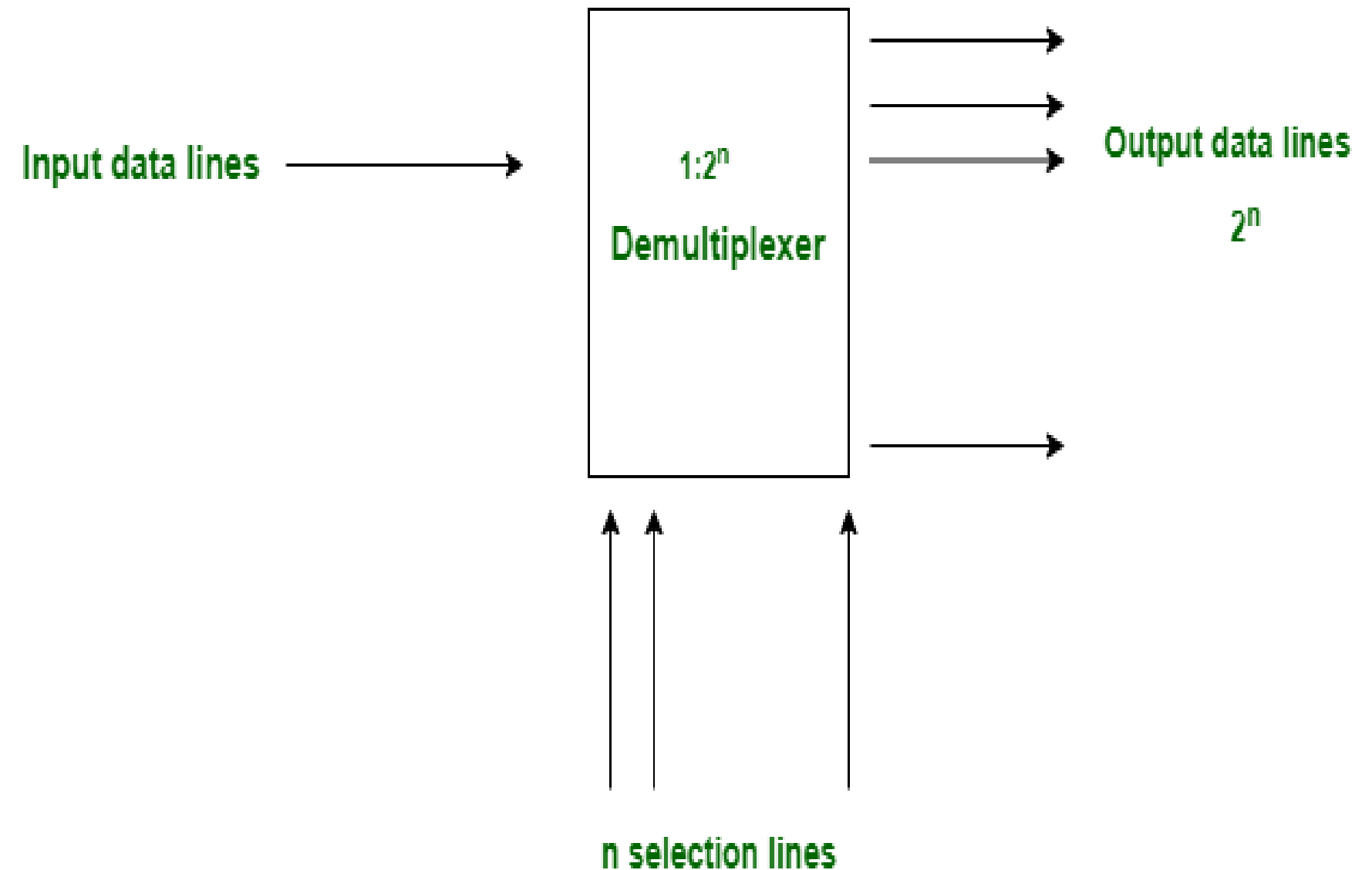
TOPIC- DEMULTIPLEXER



DEMULTIPLEXER



- A Demultiplexer is a combinational logic circuit that accepts a single input and distributes it over several output lines.
- As Demultiplexer is used to transmit the same data to different destinations, hence it is also known as **data distributor**.





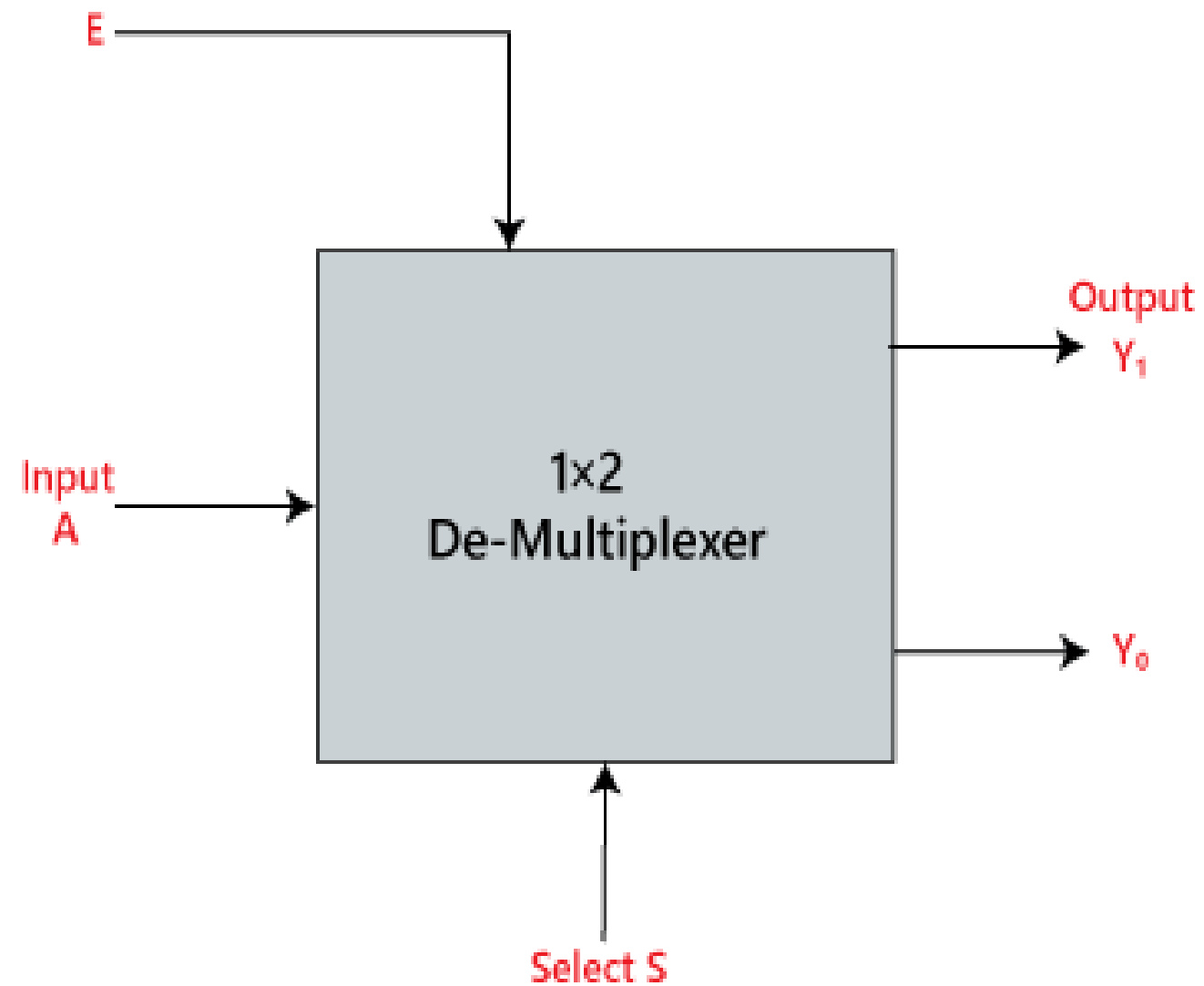
TYPES OF DEMUX

The Demux can be of different types based on input

- **1×2 Demux** - The 1×2 Demultiplexer consists of 1 input line (I), 1 select line (S), and 2 output lines (Y0 and Y1).
- **1×4 Demux** - The 1×4 Demultiplexer has 1 input line (I), 2 select line (S0 and S1), and 4 output lines (Y0, Y1, Y2, and Y3).



BLOCK DIAGRAM AND TRUTH TABLE



1x2 Demux

Truth Table:

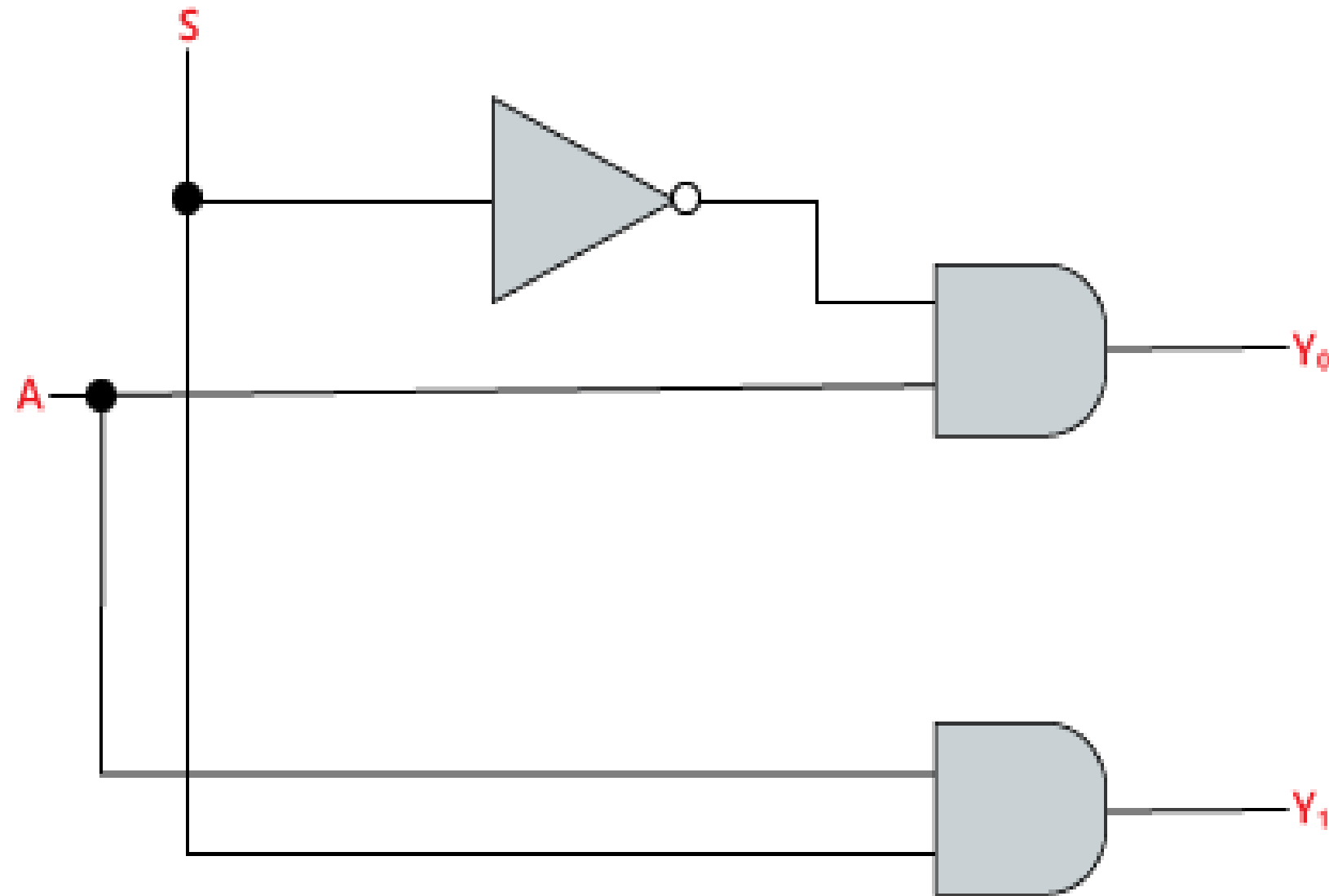
INPUTS	Output	
S ₀	Y ₁	Y ₀
0	0	A
1	A	0

$$Y_0 = S_0' \cdot A$$

$$Y_1 = S_0 \cdot A$$



IMPLEMENTATION

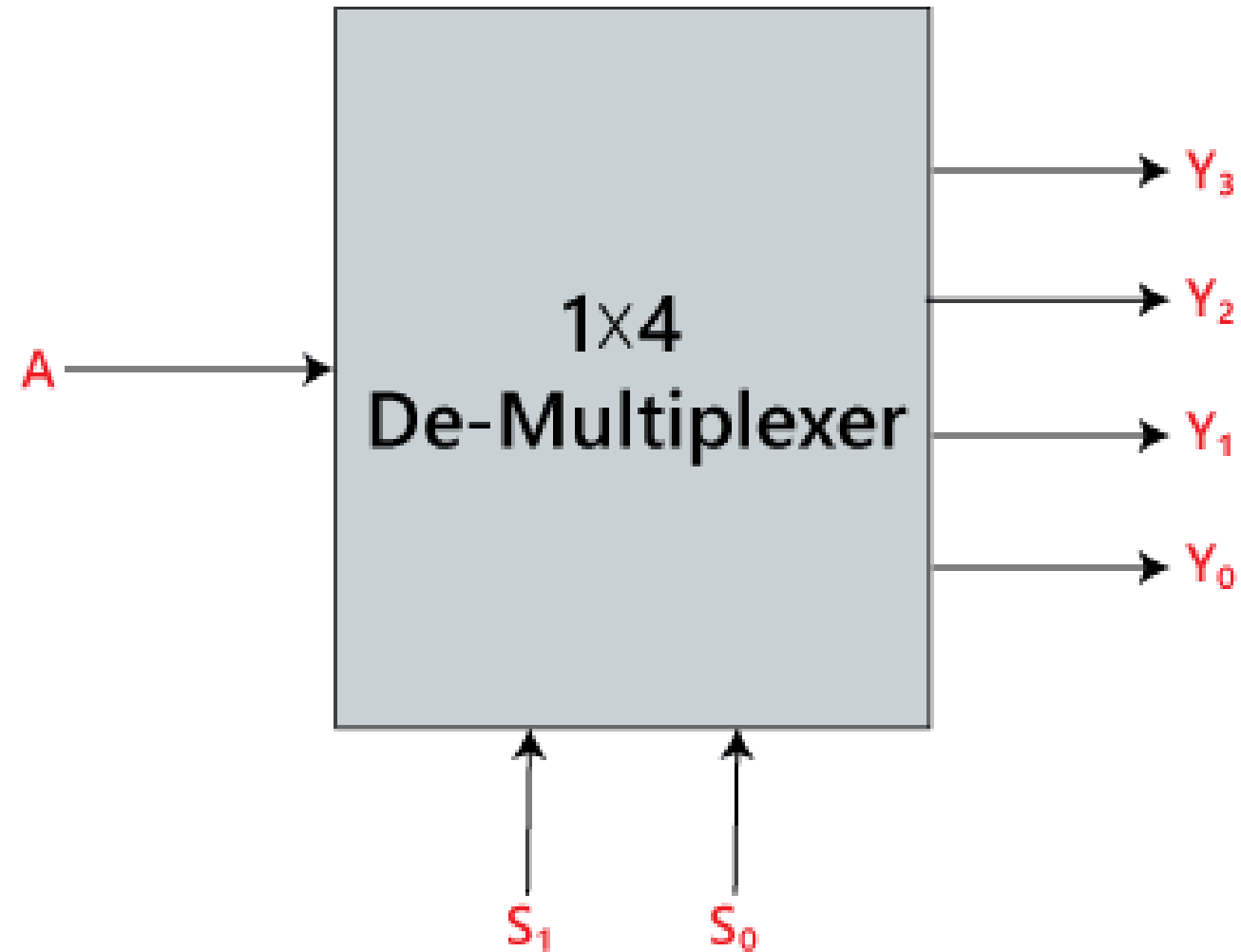


$$Y_0 = S_0' \cdot A$$

$$Y_1 = S_0 \cdot A$$



BLOCK DIAGRAM AND TRUTH TABLE



1x4 Demux

Truth Table:

INPUTS		Output			
S ₁	S ₀	Y ₃	Y ₂	Y ₁	Y ₀
0	0	0	0	0	A
0	1	0	0	A	0
1	0	0	A	0	0
1	1	A	0	0	0

$$Y_0 = S_1' S_0' A$$

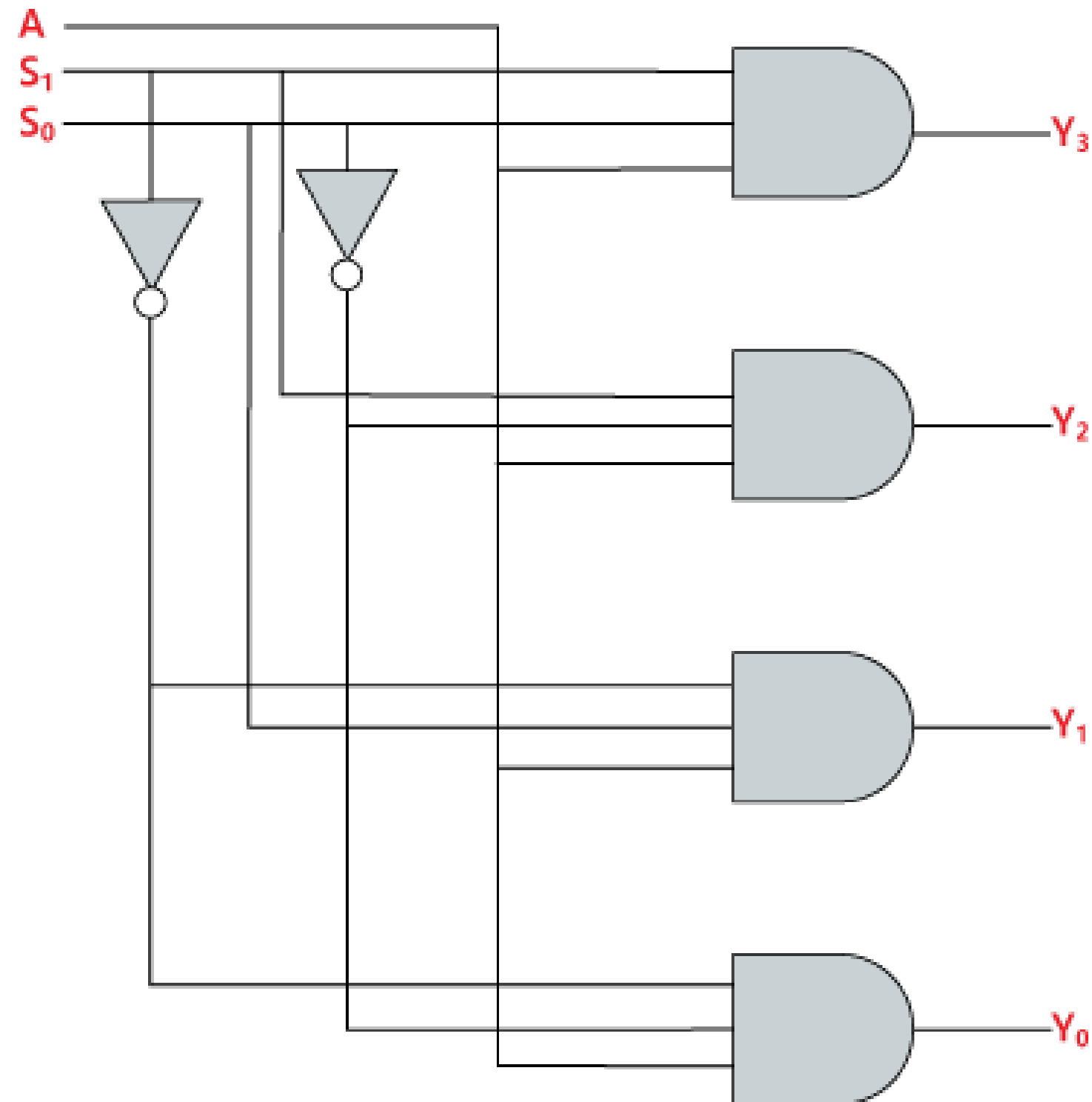
$$Y_1 = S_1' S_0 A$$

$$Y_2 = S_1 S_0' A$$

$$Y_3 = S_1 S_0 A$$



IMPLEMENTATION



$$Y_0 = S_1' S_0' A$$

$$Y_1 = S_1' S_0 A$$

$$Y_2 = S_1 S_0' A$$

$$Y_3 = S_1 S_0 A$$



APPLICATIONS OF DEMULTIPLEXER



1. Data Routing
2. Data Selection
3. Series and Parallel Converters
4. Broadcasting of ATM Packets
5. Automatic Test Equipment design





ADVANTAGES AND DISADVANTAGES



ADVANTAGES

- By using Demultiplexers, we can increase the efficiency of the communication systems.
- Demultiplexer can separate different signals from a mixed signal stream.
- Demultiplexer can decode the signals produced by a multiplexer.

DISADVANTAGES

- cause wastage of bandwidth
- synchronization create a delay in the system





ASSESSMENT QUESTIONS



1. The word demultiplex means _____
 - a) One into many
 - b) Many into one
 - c) Distributor
 - d) One into many as well as Distributor**
2. Why is a demultiplexer called a data distributor?
 - a) The input will be distributed to one of the outputs**
 - b) One of the inputs will be selected for the output
 - c) The output will be distributed to one of the inputs
 - d) Single input to Single Output
3. Most demultiplexers facilitate which type of conversion?
 - a) Decimal-to-hexadecimal
 - b) Single input, multiple outputs**
 - c) AC to DC
 - d) Odd parity to even parity





THANK YOU