DIGITAL ELECTRONICS:
MULTIPLEXER

SNS COLLEGE OF ENGINEERING

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An Autonomous Institution

Accredited by NAAC – UGC with 'A' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

MULTIPLEXER

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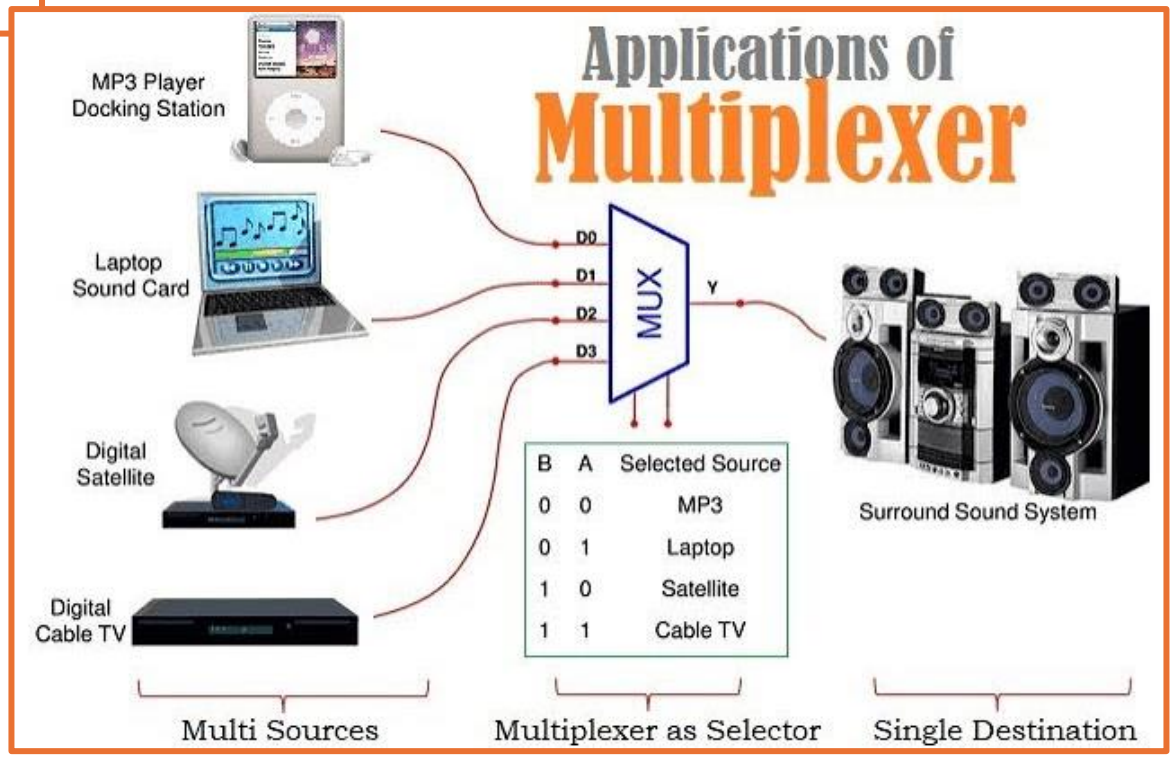
MULTIPLEXER

A device that selects between **several analog or digital input** signals and forwards the selected input to a **single output line**. It is also known as a data selector.

A multiplexer is a combinational circuit that has **2^n input lines**, **'n' selection lines** and a **single output line**.

APPLICATIONS

- ✓ Communication System
- ✓ Arithmetic Logic Unit
- ✓ Parallel to Serial Converter

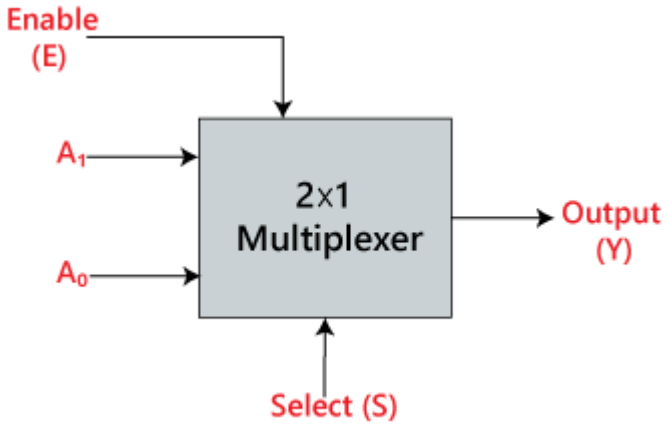


TYPES OF MULTIPLEXERS

- ✓ 2:1 multiplexer (1select line)
- ✓ 4:1 multiplexer (2 select lines)
- ✓ 8:1 multiplexer(3 select lines)
- ✓ 16:1 multiplexer (4 select lines)

2: 1MULTIPLEXER

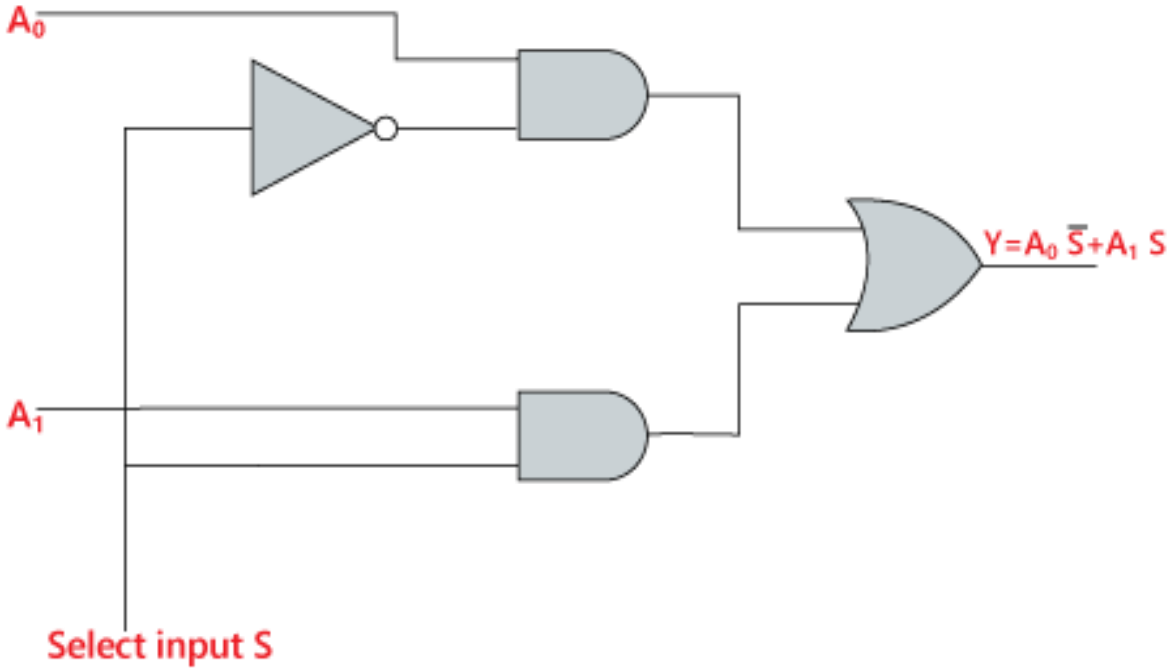
There are two inputs,(A_0 and A_1), 1 selection line(S) and single output(Y).



2: 1MULTIPLEXER

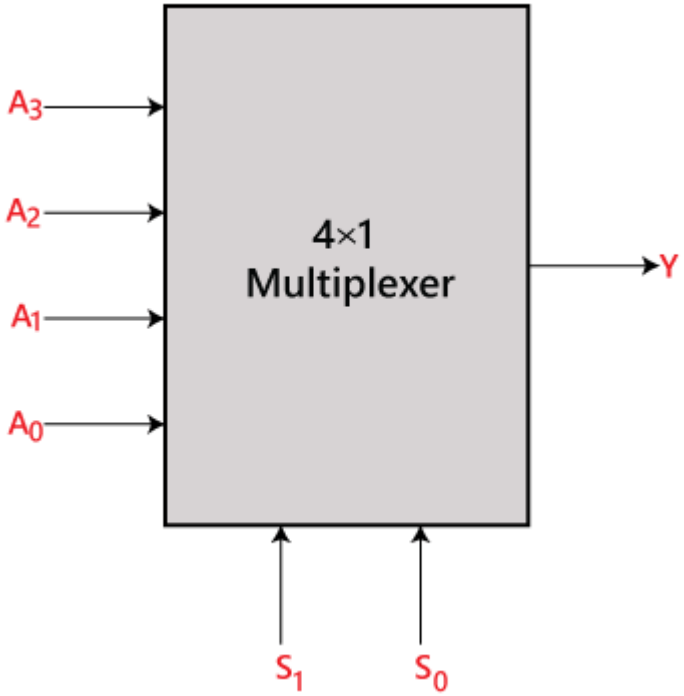
INPUTS	Output
S	Y
0	A_0
1	A_1

$$Y = S'.A_0 + S.A_1$$



4 : 1MULTIPLEXER

There are four inputs,(A_0, A_1, A_2, A_3), 2 selection line(S_0,S_1) and single output(Y).

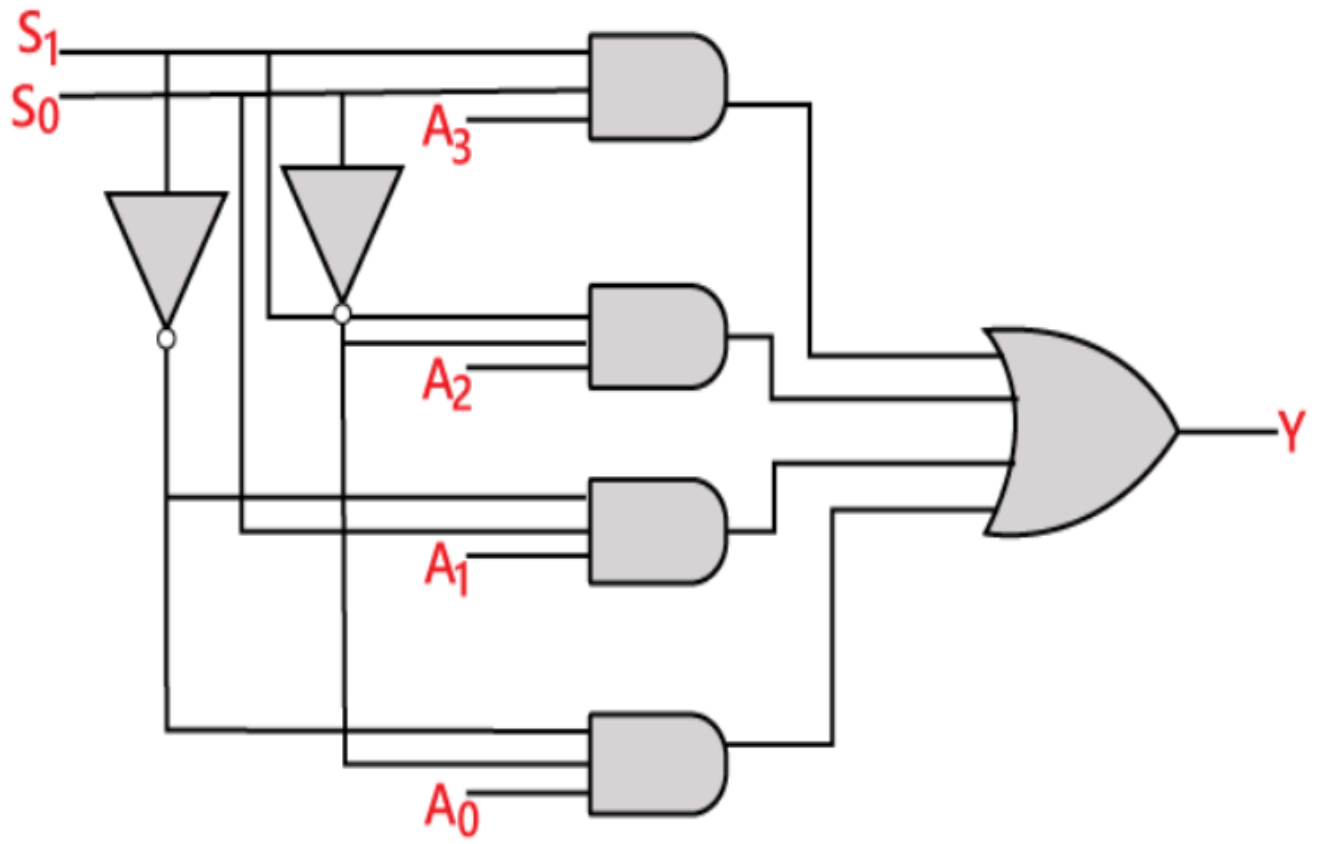


4 : 1MULTIPLEXER

INPUTS		Output
S_1	S_0	Y
0	0	A_0
0	1	A_1
1	0	A_2
1	1	A_3

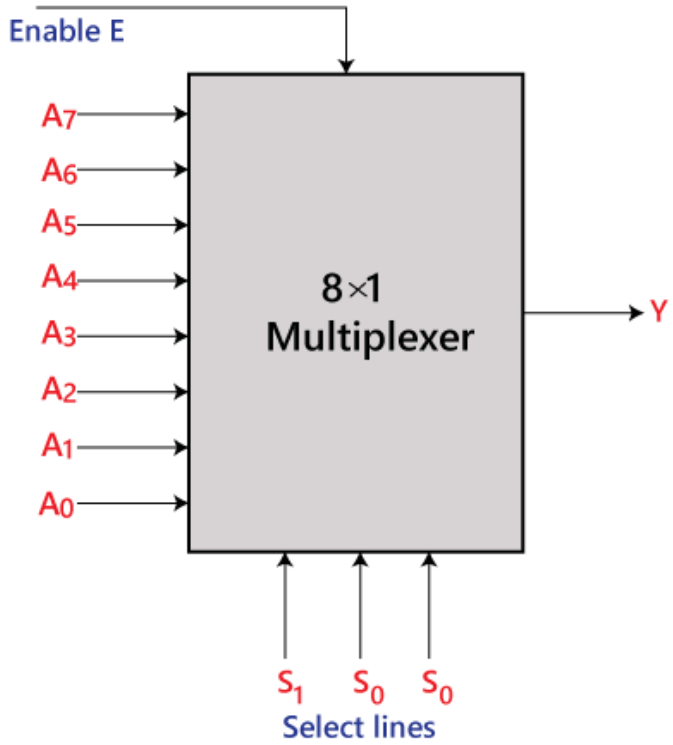
The logical expression of the term Y is as follows:

$Y=S_1' S_0' A_0+S_1' S_0 A_1+S_1 S_0' A_2+S_1 S_0 A_3$



8 : 1 MULTIPLEXER

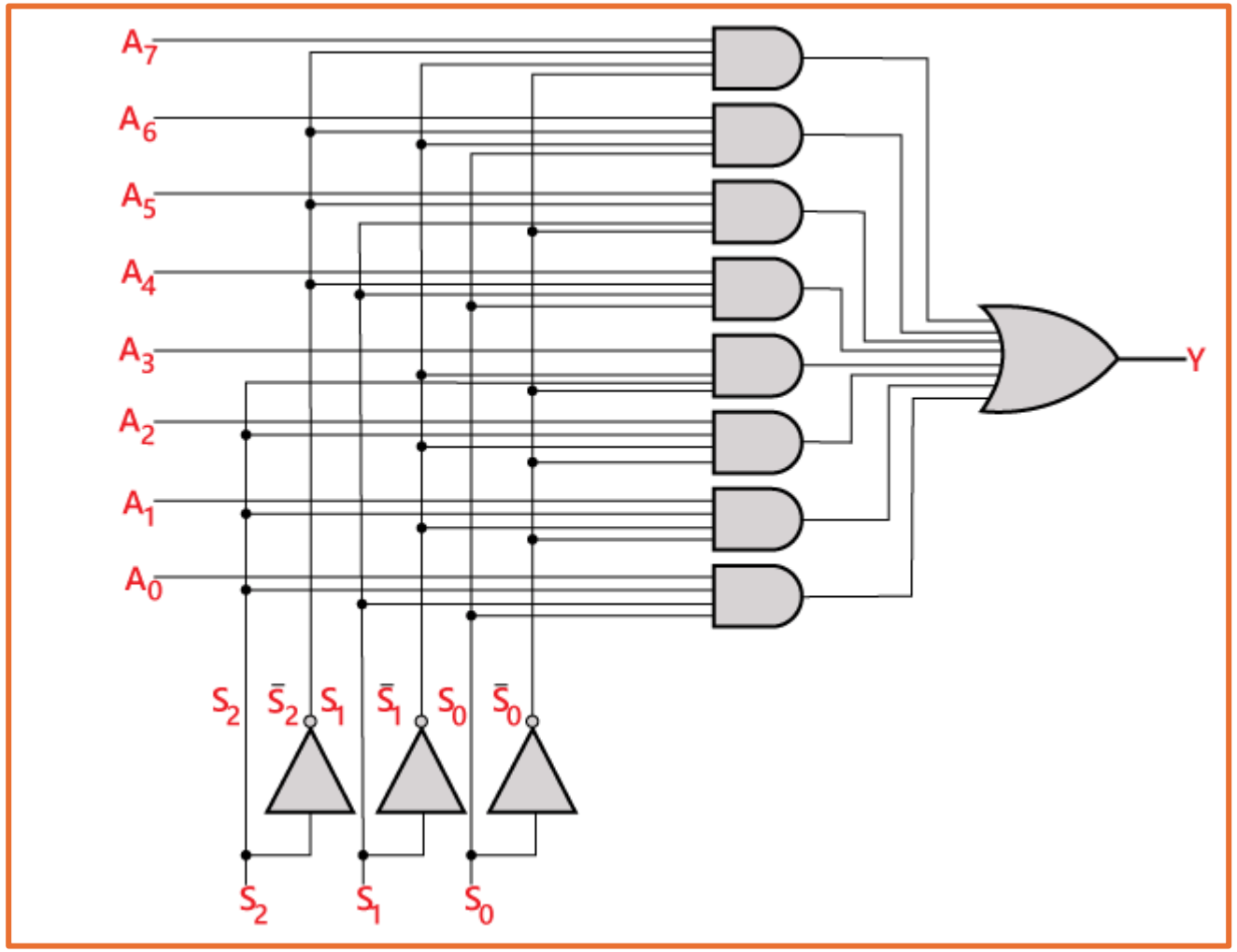
There are eight inputs,(A_0, A_1, A_2, A_3, A_4, A_5, A_6, and A_7), 3 selection line (S_0,S_1, S_2) and single output(Y).



8 : 1MULTIPLEXER

INPUTS			Output
S_2	S_1	S_0	Y
0	0	0	A_0
0	0	1	A_1
0	1	0	A_2
0	1	1	A_3
1	0	0	A_4
1	0	1	A_5
1	1	0	A_6
1	1	1	A_7

$Y=S_0'.S_1'.S_2'.A_0+S_0.S_1'.S_2'.A_1+S_0'.S_1.S_2'.A_2+S_0.S_1.S_2'.A_3+$
$S_0'.S_1'.S_2\ A_4+S_0.S_1'.S_2\ A_5+S_0'.S_1.S_2\ .A_6+S_0.S_1.S_3.A_7$



Assessment

1. For a 16:1 Multiplexer, how many selection lines are required?

2. Name the device that converts parallel data to serial data.


Thank
you