Experiment No: 7

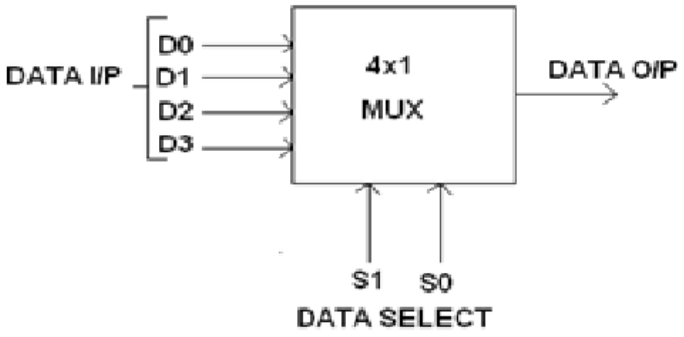
AIM: To design and implement Multiplexer and De-multiplexer using logic gates and study of IC74150 and IC 74154.

APPARATUS REQUIRED: IC trainer kit, IC 74150, IC 74154, Patch cord AND gate, OR gate

MULTIPLEXER:

Multiplexer means transmitting a large number of information units over a smaller number of channels or lines. A digital multiplexer is a combinational circuit that selects binary information from one of many input lines and directs it to a single output line. The selection of a particular input line is controlled by a set of selection lines. Normally there are 2n input line and n selectionlines whose bit combination determine which input is selected.

BLOCK DIAGRAM FOR 4:1 MULTIPLEXER:

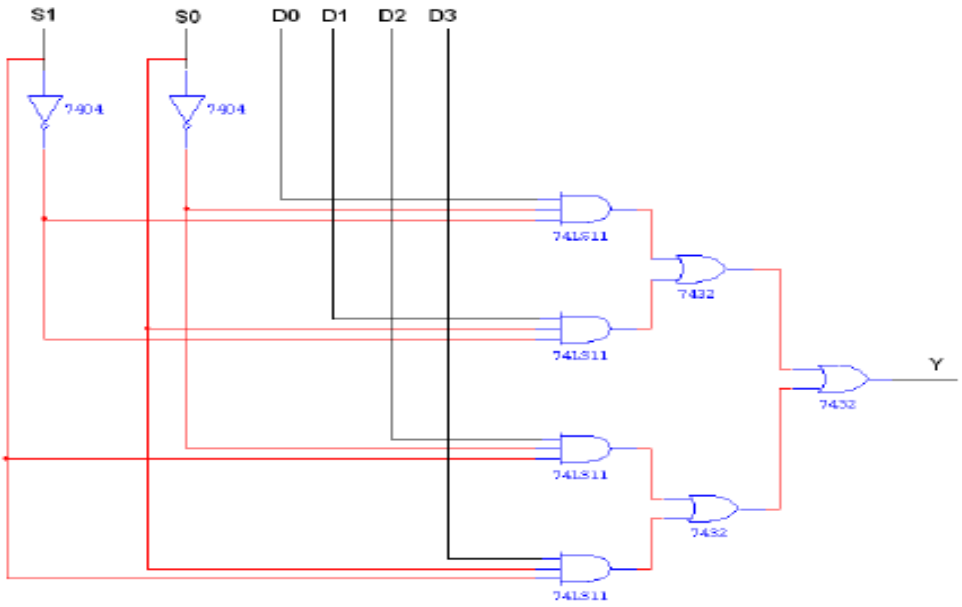


TRUTH TABLE FOR 4:1 MULTIPLEXER:

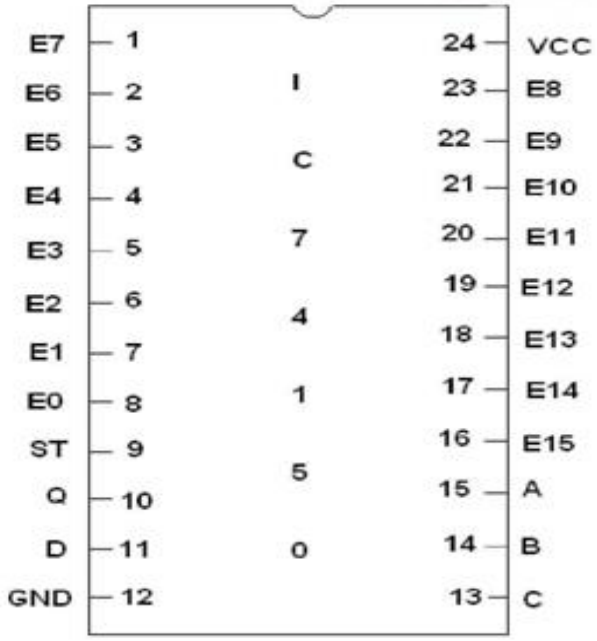
S_1	S_0	Inputs
0	0	D_0
0	1	D_1
1	0	D_2
1	1	D_3

Y = D0 S1' S0' + D1 S1' S0 + D2 S1 S0' + D3 S1 S0

CIRCUIT DIAGRAM FOR MULTIPLEXER:



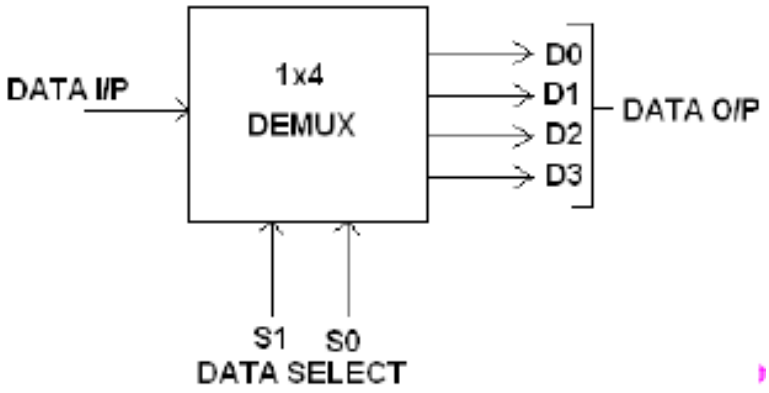
PIN DIAGRAM FOR IC 74150:



DEMULTIPLEXER:

The function of Demultiplexer is in contrast to multiplexer function. It takes information from one line and distributes it to a given number of output lines. For this reason, the demultiplexer is also known as a data distributor. Decoder can also be used as demultiplexer. In the 1: 4 demultiplexer circuit, the data input line goes to all of the AND gates. The data select lines enable only one gate at a time and the data on the data input line will pass through the selected gate to the associated data output line.

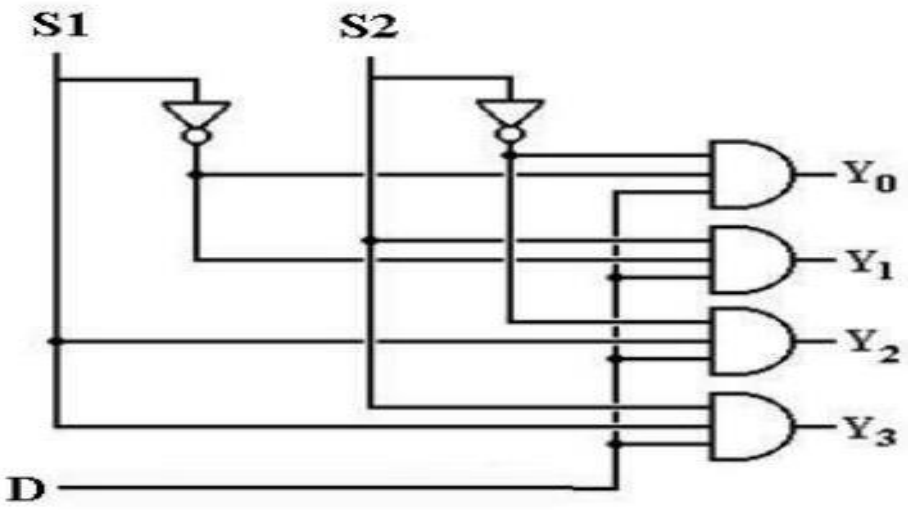
BLOCK DIAGRAM FOR 1:4 DEMULTIPLEXER:



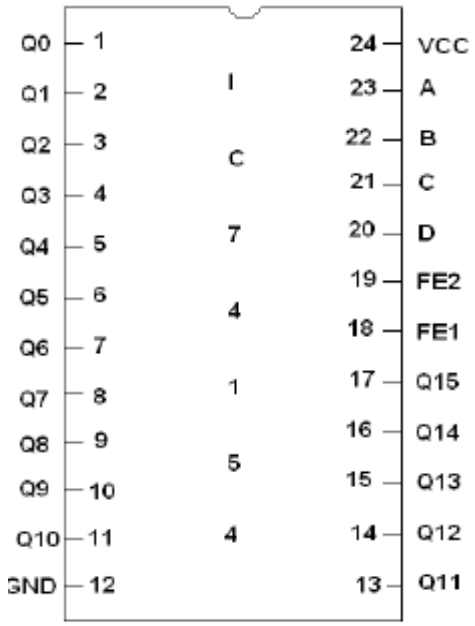
TRUTH TABLE FOR 1:4 DEMULTIPLEXER*:*

Data Input	Select Inputs		Outputs			
D	S_1	S_0	Y_3	Y_2	Y_1	Y_0
D	0	0	0	0	0	D
D	0	1	0	0	D	0
D	1	0	0	D	0	0
D	1	1	D	0	0	0

CIRCUIT DIAGRAM OF DEMULTIPLEXER:



PIN DIAGRAM FOR IC 74154



Result: Hence the Multiplexer and De-multiplexer are performed successfully