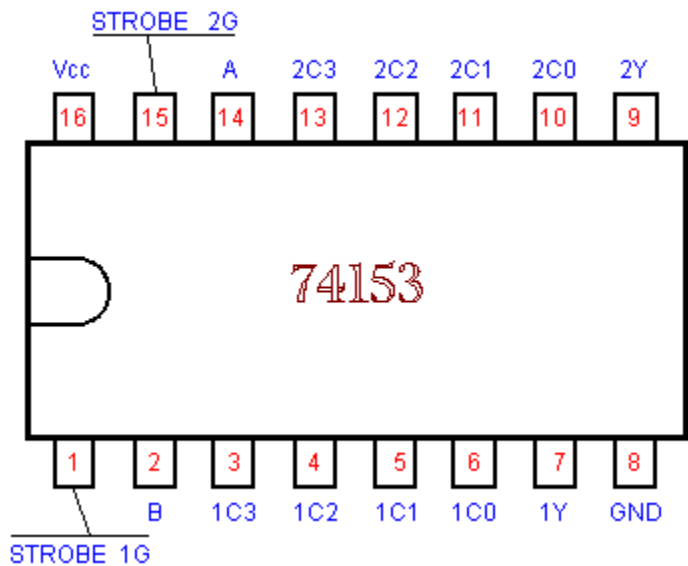**AIM:** IMPLEMENTATION OF 4X1 MULTIPLEXER USING LOGIC GATES.

APPARATUS REQUIRED: Power Supply, Digital Trainer, Connecting Leads, IC's 74153(4x1 multiplexer)
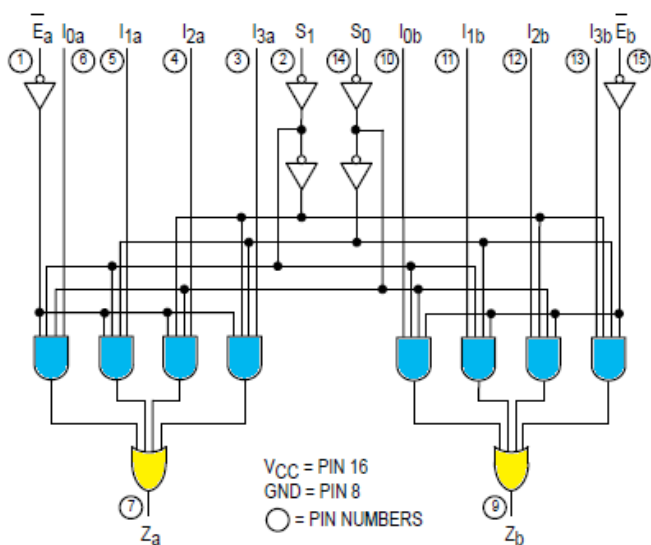
BRIEF THEORY:

MULTIPLEXER: Multiplexer generally means many into one. A multiplexer is a circuit with many Inputs but only one output . By applying control signals we can steer any input to the output .The fig.(1) Shows the general idea . The ckt. has n-input signal, control signal & one output signal . Where $2^n = m$. One of the popular multiplexer is the 16 to 1 multiplexer, which has 16 input bits, 4 control bits & 1 output bit.

CIRCUIT DIAGRAM:

IC 74153 (4x1 multiplexer)

LOGIC DIAGRAM

Top pin labels: $\overline{E_a}$ I_{0a} I_{1a} I_{2a} I_{3a} S_1 S_0 I_{0b} I_{1b} I_{2b} I_{3b} $\overline{E_b}$

Pin numbers: ① ⑥⑤ ④ ③ ② ⑭ ⑩ ⑪ ⑫ ⑬ ⑮

Z_a ⑦

Z_b ⑨

V_{CC} = PIN 16
GND = PIN 8
◯ = PIN NUMBERS

PROCEDURE:

1. Fix the IC's on the bread board &give the input supply.
2. Make connection according to the circuit.
3. Give select signal and strobe signal at respective pins.
4. Connect +5 v Vcc supply at pin no 24 & GND at pin no 12
5. Verify the truth table for various inputs.

OBSERVATION TABLE:

INPUT							OUTPUT
A	B	C0	C1	C2	C3	G	Y
X	X	X	X	X	X	1	0
0	0	0	X	X	X	0	0
0	0	1	X	X	X	0	1
0	1	X	0	X	X	0	0
0	1	X	1	X	X	0	1
1	0	X	X	0	X	0	0
1	0	X	X	1	X	0	1
1	1	X	X	X	0	0	0
1	1	X	X	X	1	0	1

Truth Table of multiplexer (4x1) IC 74153

RESULT: Verify the truth table of multiplexer for various inputs.

PRECAUTIONS:

1) Make the connections according to the IC pin diagram.
2) The connections should be tight.
3) The V_{cc} and ground should be applied carefully at the specified pin only.