Objective:

To design a composite logic unit using multiplexer.

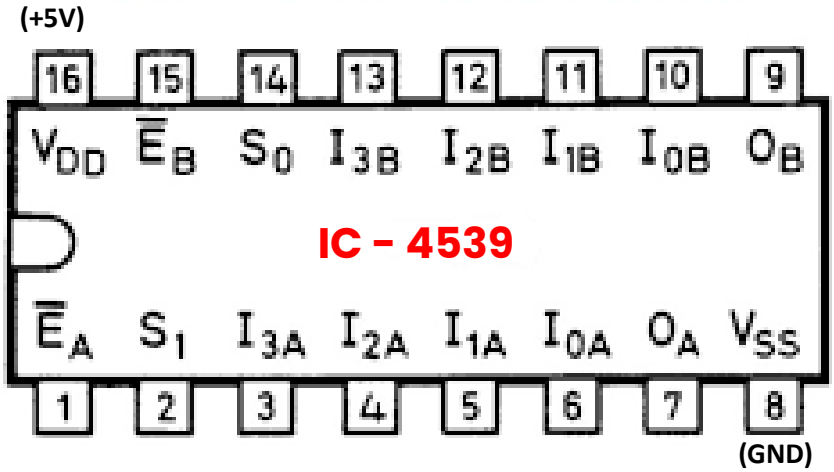
Theory:

Logic microoperations are very useful for manipulating individual bits or a portion of a word stored in a register. They can be used to change bit values, delete group of bits, or insert new bit values into a register. These microoperations require different logic gates to be inserted for each bit or pair of bits in the register to perform the required operation. Although there are several logic microoperations, most computers use only four- AND, OR, XOR and NOT – from which all others can be derived.

Component Required:

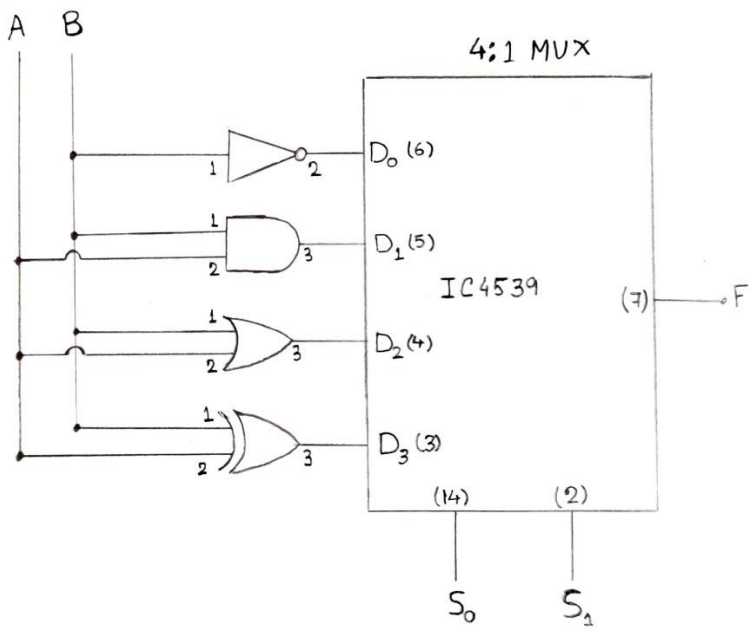
Sl No.	Item	Specification	Qty.
1	IC 4539	Dual 4-input multiplexer	1
2	IC 4069	NOT Gate	1
3	IC 4081	AND Gate	1
4	IC 4071	OR Gate	1
5	IC 4070	XOR Gate	1
6	Digital Trainer Kit	-	1
7	Breadboard	-	1
8	Wires	-	-

Pin Diagram:



Pin diagram of Dual 4-input multiplexer (IC4539)

Circuit Diagram:



Circuit Diagram of Composite Logic Unit using Multiplexer

Truth Table:

Select Lines		Input		Output (F_i)	Operation
S_1	S_0	A_i	B_i		
0	0	×	0	1	NOT
0	1	1	0	0	AND
1	0	0	1	1	OR
1	1	1	1	0	XOR

Conclusion:

Composite logic unit circuit was made using multiplexer and truth table was verified.