

Name of the experiment:

Design and Implementation of the following circuit
mux and adder circuit.

Objective:

To design and implement a circuit that performs
2-bit addition or subtraction based on two
selection variables.

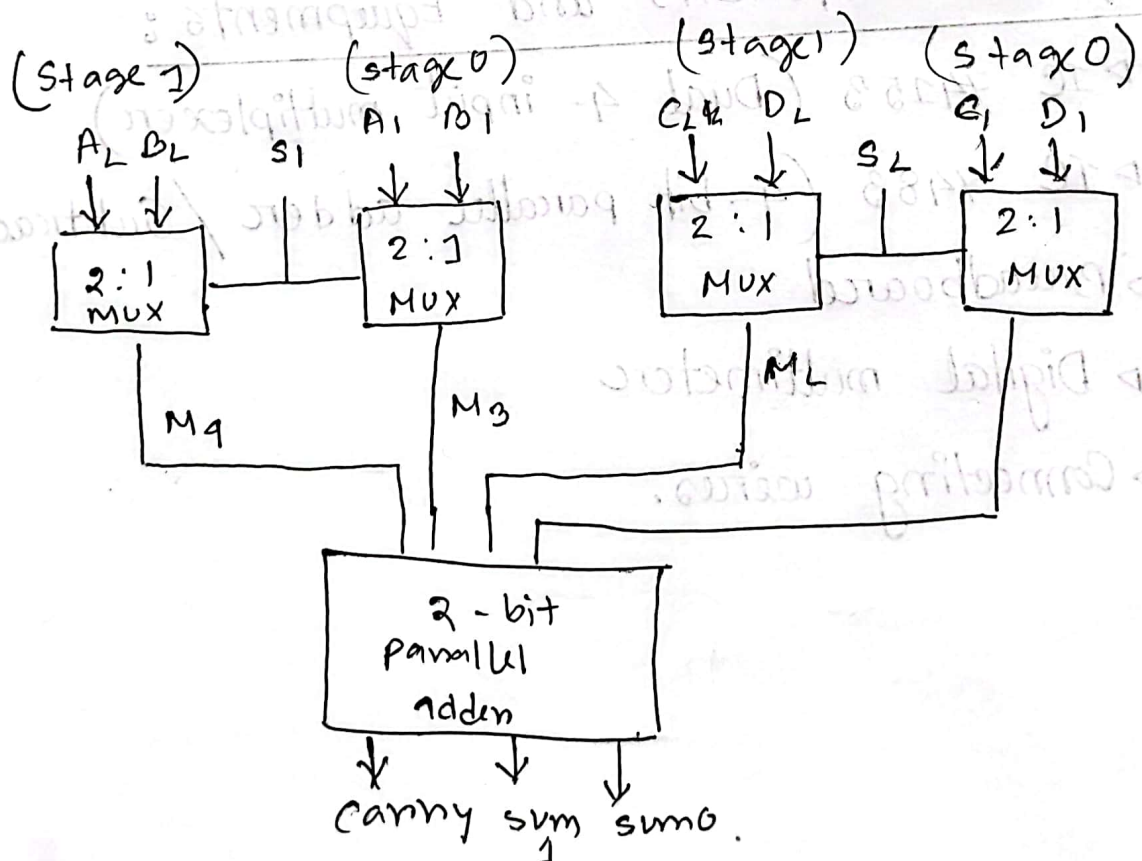
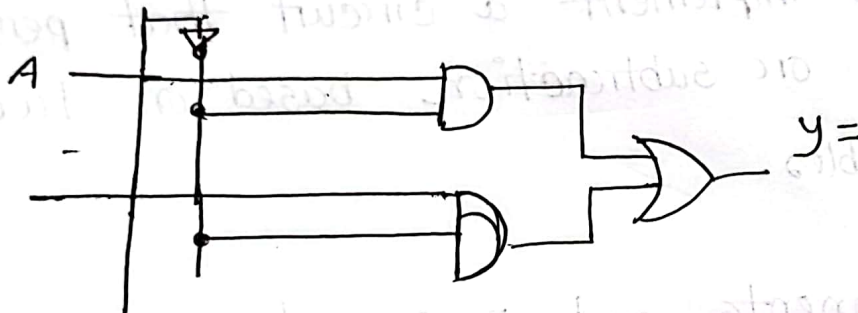
Required Components and Equipments:

- IC 74153 (Dual 4-input multiplexer)
- IC 7483 (4-bit parallel adder / Subtractor)
- Breadboard
- Digital multimeter
- Connecting wires.

Experimental Setup :-

2 : 1 mux circuit diagram

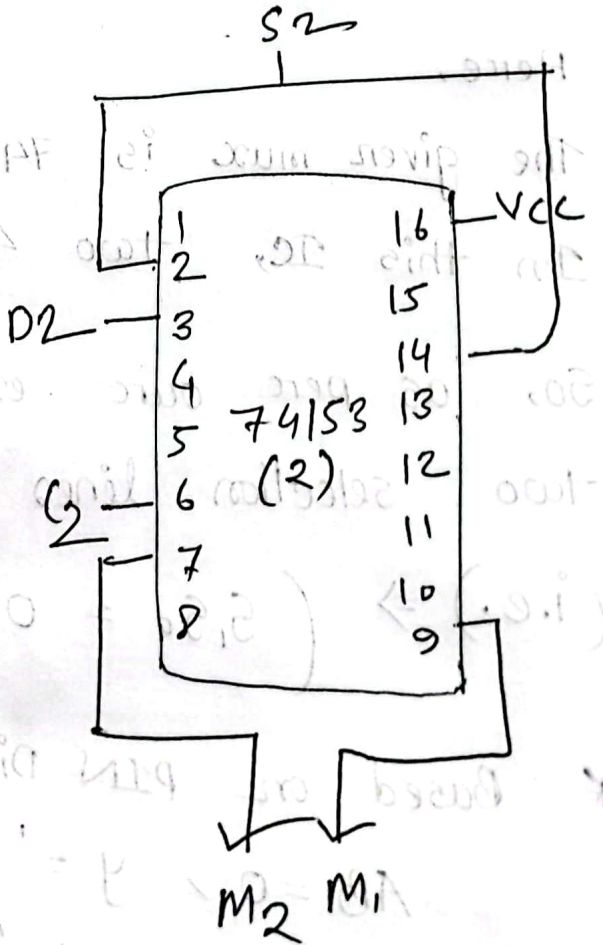
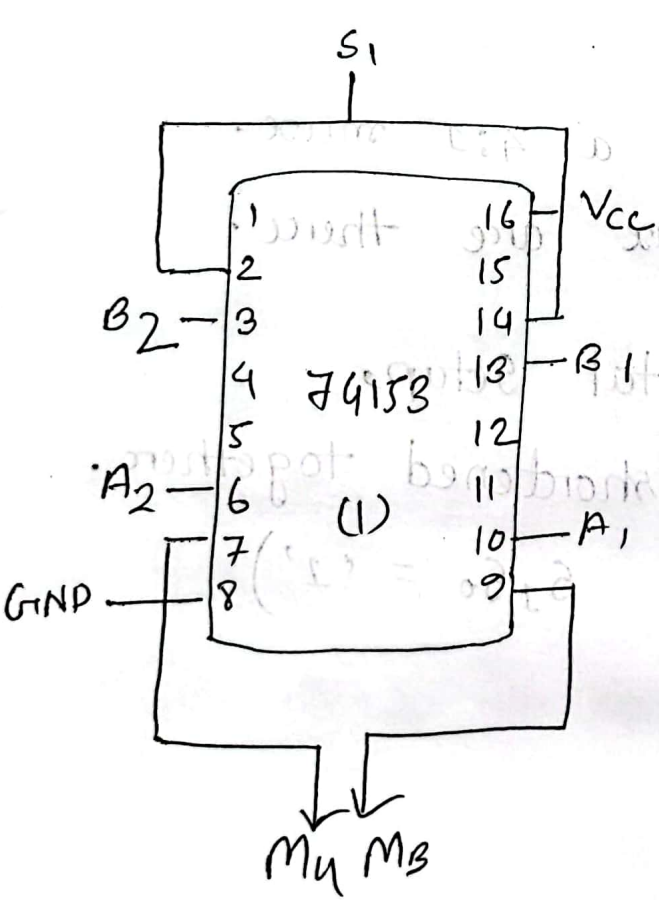
Selector (S1)	y
0	A
1	B



M_1, M_2, M_3 and M_4 are multiplexers o/p's

Truth table

i/p's		O/p's			
S ₁	S ₂	M ₄	M ₃	M ₂	M ₁
0	0	A ₂	A ₁	C ₂	C ₁
0	1	A ₂	A ₁	D ₂	D ₁
1	0	B ₂	B ₁	C ₂	C ₁
1	1	B ₂	B ₁	D ₂	D ₁





22

12

22

0.5

5

11

2000

Result and Discussion :-

According to the experimental setup, logical diagram was designed and results are verified.

$$S_1 = 0, S_2 = 1$$

Based on the selection,

$M_4 \rightarrow$

$$\begin{array}{r} 01 \\ + 10 \\ \hline \end{array}$$

sum 1 \swarrow 1 1 \searrow sum 0

sum $\rightarrow 0 \rightarrow 1$

sum 1 $\rightarrow 1$

carry $\rightarrow 0$

Based on selection line,

$M_4 \rightarrow A_2, M_2 \rightarrow D_2$

$M_3 \rightarrow A_1, M_1 \rightarrow D_1$

$A_2 = 0, A_1 = 1$

$D_2 = 1, D_1 = 0$

Hence, 74153 is a 4:1 mux; so that we require only 2:1 mux.

Selection pins are shortened. If $AB = 0$; it selects 'C0',

If $AB = 1$, it selects 'C3'