Project Title: MULTIPLEXERS

Course: ELET 1210 – DIGITAL EELECTRONICS 1

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Contents

Introduction 3
Description of Experimental Setup/List of Equipment Used 3
Logic Diagram Experiment 1 3
Pictorial Diagram Experiment 1 4
Block Diagram for Experiment 1 4
Procedure/Method 4
Results 5
Discussion and Conclusion 5

Introduction

This report will be discussing multiplexers. A multiplexer or MUX, also called a data selector, is a combinational circuit with multiple input lines, one output line and more than one selection line. Based on the logic status of the selection inputs, a multiplexer takes the information present on the selected input line, and routes it to the output line. This report will show the functionality of a multiplexer through diagrams, tables, and circuits.

Description of Experimental Setup/List of Equipment Used

The equipment used for this experiment include, a breadboard, power supply, wires, a DIP switch, resistors, an LED, and ICs.

Required IC's:

74LS04 Hex Inverter

74LS32 Quad 2 – Input OR

74LS11 Triple 3-Input AND - 2

Logic Diagram Experiment 1

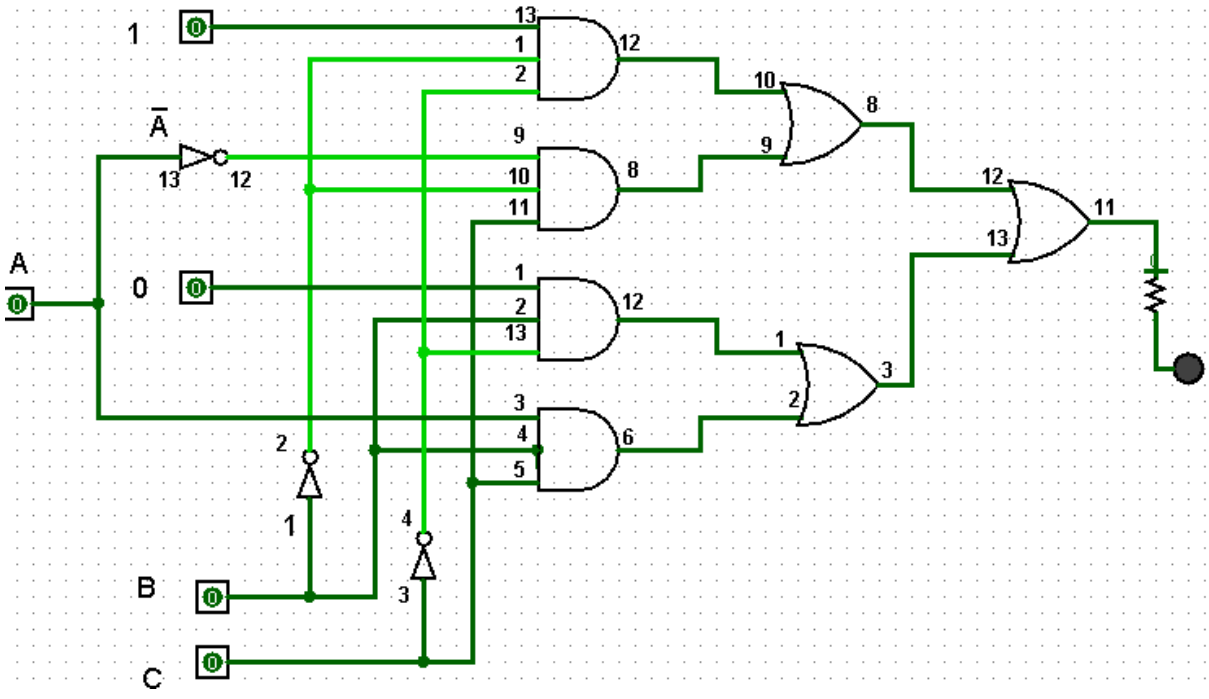

Figure A : Logic Diagram for $F(A, B, C) = \sum(0,1,4,7)$

Pictorial Diagram Experiment 1

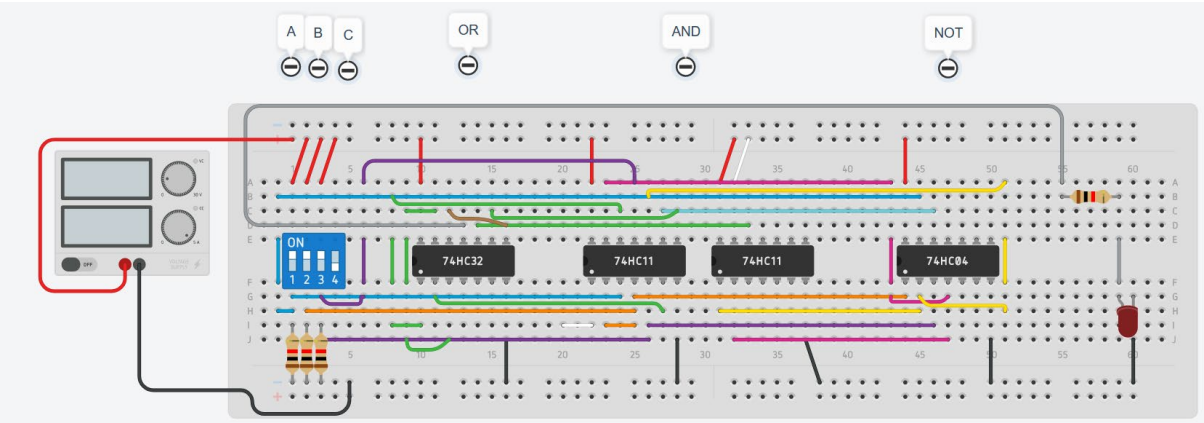

Figure B : Pictorial Diagram for $F(A, B, C) = \sum(0,1,4,7)$

Block Diagram for Experiment 1

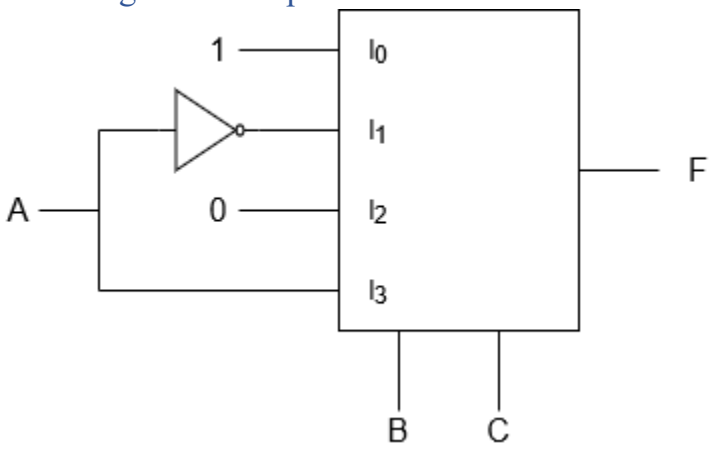

Figure C : Pictorial Diagram for $F(A, B, C) = \sum(0,1,4,7)$

Procedure/Method

The Boolean function $F(A, B, C) = \sum(0,1,4,7)$ was first used to make the table figure E. The function was then inspected and according to values which output was 1 in each column output was calculated. The output was then used to create the block diagram showed in Figure C and tables in Figures D and F. All equipment was then gathered, and setup as showed in the pictorial diagram, Figure B. The power supply was turned on and the DIP switch was then used to put in different input from the truth tables and output was showed in the LEDs. The LED being on signified an output of 1 and the LED being offed signified off. Experiment 1 had 8 different inputs and outputs for each input were checked and recorded and compared with the truth table. Finally, after inputs were entered for each experiment the power supply was turned off.

Results

Table for $F(A, B, C) = \sum(0,1,4,7)$			
A	B	C	F
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Figure D

	I_0	I_1	I_2	I_3
$\overline{A}$	0	1	2	3
A	4	5	6	7
	1	$\overline{A}$	0	A

Figure E : Table for expression $F(A, B, C) = \sum(0,1,4,7)$

B	C	F
0	0	I_0
0	1	I_1
1	0	I_2
1	1	I_3

Figure F : Table for expression $F(A, B, C) = \sum(0,1,4,7)$

Discussion and Conclusion

In conclusion, nothing unusual was shown and results were shown as expected. The multiplexer implementation was shown through tables and diagrams and proven to work through circuits.