INDRAPRASTHA INSTITUTE *of*
INFORMATION TECHNOLOGY
DELHI

Department
of
Electronics & Communication Engineering

ECE111|Digital Circuits
Section: B

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Lab_4:

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7 Feb 2022

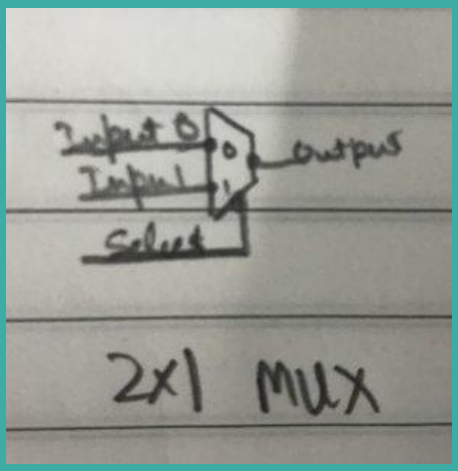
ALU

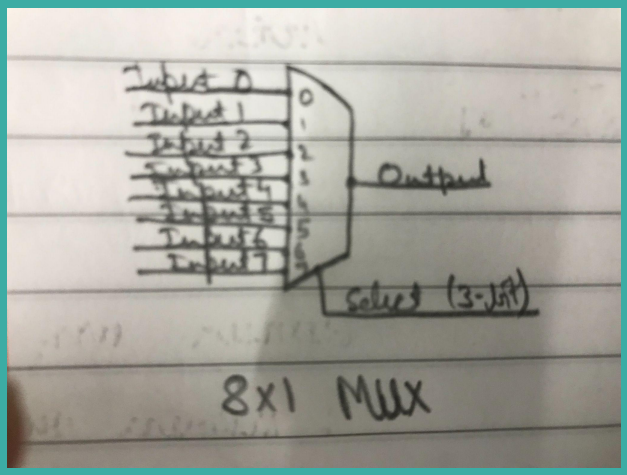
Aim: To create a 1-bit ALU

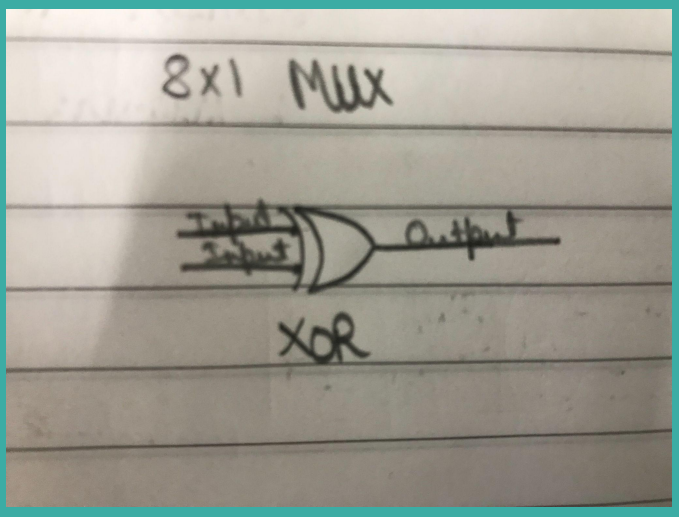
Components/ICs Used: XOR gate, 2x1 MUX, 8x1 MUX, inputs and outputs

Link of CIRCUITVERSE Workspace:
https://circuitverse.org/users/116502/projects/lab04-b54f429f-fbbe-45f9-8913-67fde4a4afba

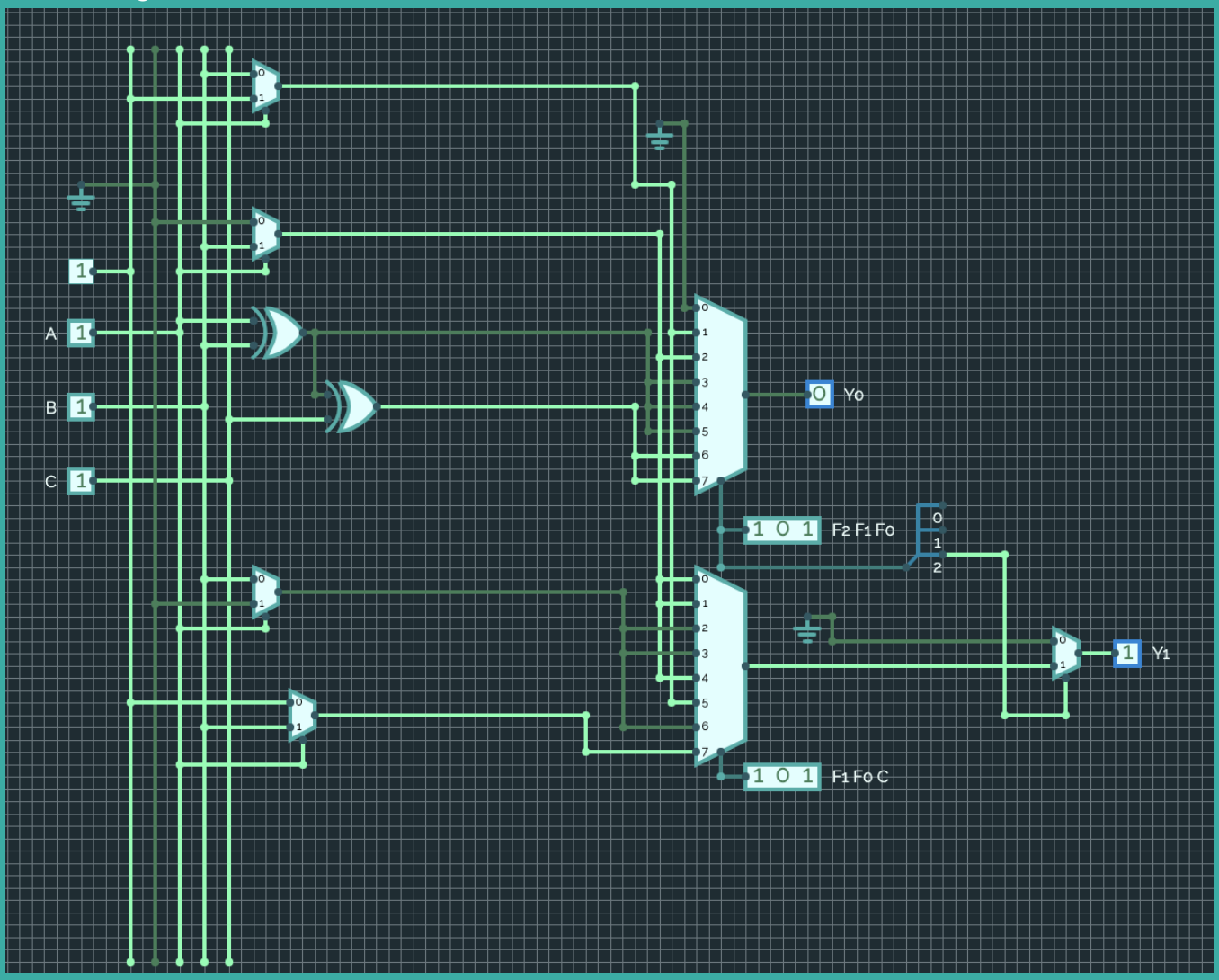
Pin Diagram of the IC:







Circuit Diagram:



Truth Table:

2x1 MUX

Select	Output
0	I0
1	I1

8x1 MUX

F2	F1	F0	Output
0	0	0	I0
0	0	1	I1
0	1	0	I2
0	1	1	I3
1	0	0	I4
1	0	1	I5
1	1	0	I6
1	1	1	I7

Observations/Results: AND, OR and NOT gates can be made using 2x1 MUX

Application: A Multiplexer (MUX) is used whenever you have multiple inputs to a circuit or a device and you have to select only one output from the given inputs.

Problem

Solution:
Main Alarm = input_J * input_K
Minor Alarm = input_L + (input_J ⊕ input_K)

Components/ICs Used: XOR gate, 2x1 MUX, inputs and outputs

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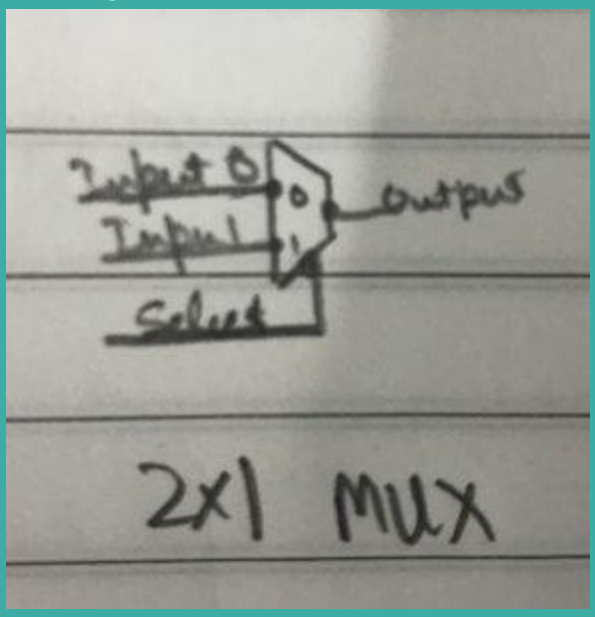
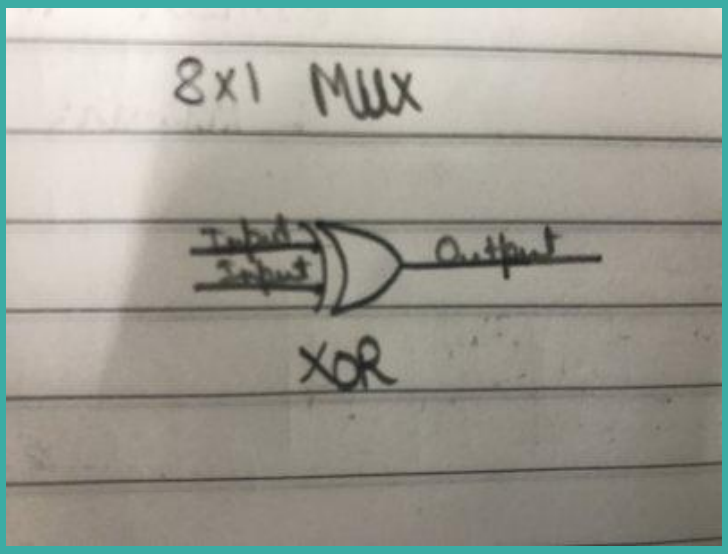
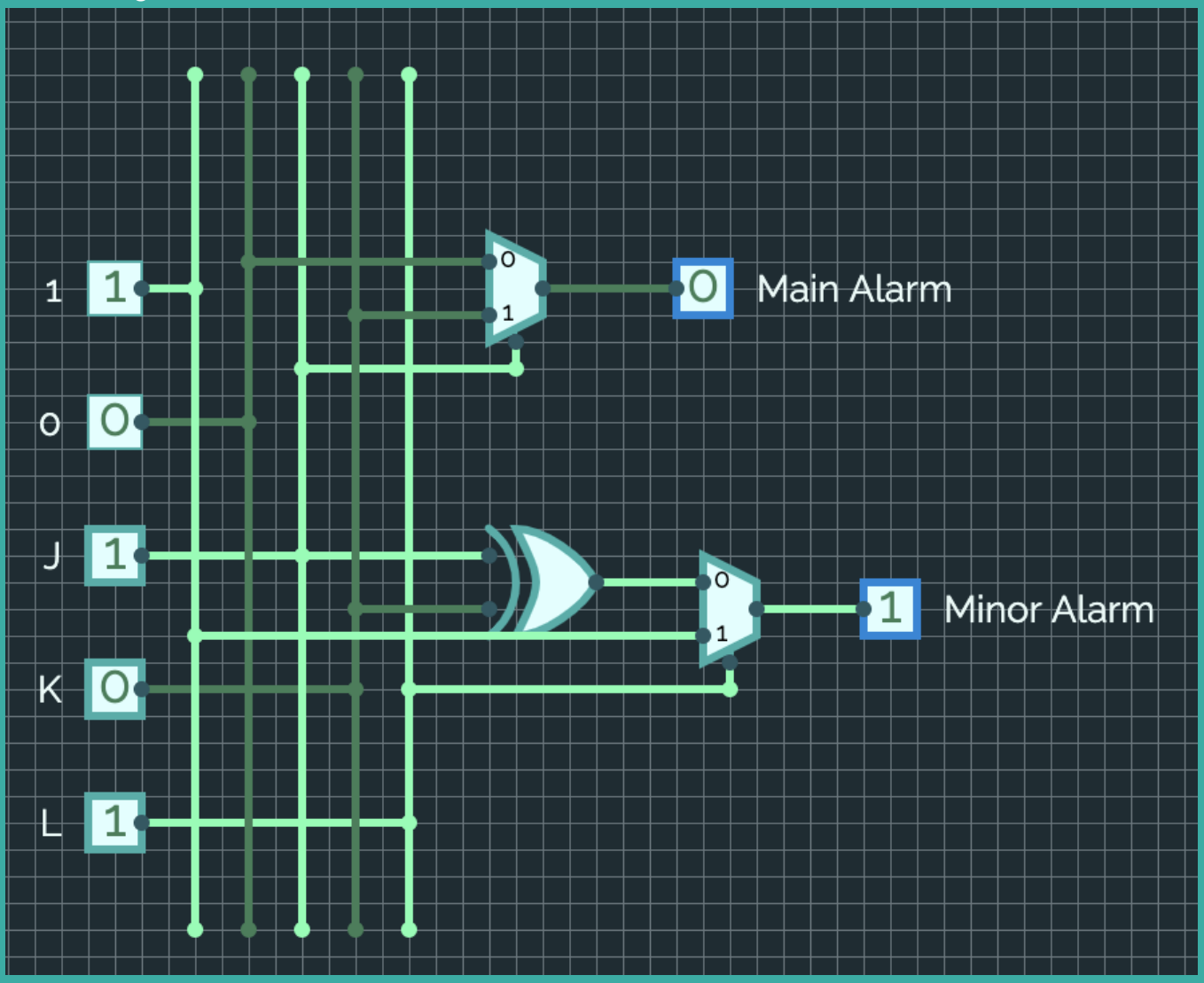




Circuit Diagram:



Truth Table:

J	K	L	Main Alarm	Minor Alarm
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	1	0
1	0	0	1	0
1	0	1	1	0
1	1	0	0	1
1	1	1	1	1