IMPLEMENTATION OF BOOLEAN LOGIC IN ARDUINO

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Abstract

Q(41)2010 GATE:For any set of A and B ,The following Circuit Gives same Answer ,Expect one?

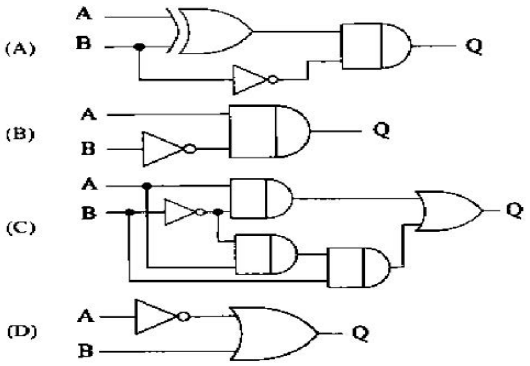

Fig. 1

1 Components

Components	Values	Quantity
Arduino		1
JumperWires	M-F	5
Breadboard		1
USB-C cable		1

2 Setup

1. Connect the Arduino to the laptop using the USBcable.
2. Open the Arduino IDE on your system.
3. Go to Tools > Board and select Arduino Uno or Nano based on your board.
4. Go to Tools > Port and select the correct COM port for your connected board.

2.1 Steps for implementation

1. Open Arduino IDE and create a new sketch (program).

2. Paste the Clanguage code into the sketch

3.Upload the code to the Arduino board using the Upload button in the IDE

4.Place Arduino on breadboard (optional).

5.Connect digital input pins (2, 3, 4) to switches or jumper wires.

6.Pull-down resistors (10kΩ to GND) recommended on inputs to prevent floating values.

7.Built-in LED on Pin 13 used to show output F

3.Implementation

What Each Circuit Does:

A: Q=(A+B)

B: Q=A

C: Simplifies to Q=A

D: Q=A′+BQ=A′+B → different logic

Observation:

Circuits A, B, and C all give similar outputs.

D uses a different logic: OR with A' (NOT A), so its output changes.

Connection Table

Component	Arduino Pin	
Switch A	D2	Input A
Switch B (optional)	D3	Input C (if needed)
Built-in LED	D13	Output indicator
GND from Arduino	GND	Connect to all switch grounds
Pull-down Resistor	10kΩ to	For each input pin (D2-D4)