# VERIFICATION OF BOOLEAN IDENTITIES

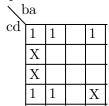
#### Rudra Pratap Singh

#### Contents

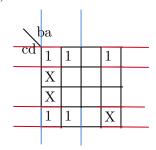
- 1 PROBLEM
- 2 COMPONENTS
- 3 TRUTH TABLE
- 4 ARDUINO CONNECTIONS
- 5 CODE

# 1 PROBLEM

(GATE CS-2008) Q.5 In the Karnaugh map shown below, X denotes a don't care term. What is the minimal form of the function represented by the Karnaugh map?



- (A) b'd' + a'd'
- (B) a'b' + b'd' + a'bd'
- (C) b'd' + a'bd'
- (D) a'b' + b'd' + a'd'



One group consists of (0000, 0010, 1000, 1010) which gives b'd' Other group is (0000, 0001, 1000, 1001) which gives a'd' So, solution is b'd' + a'd'. Hence , correct option is a).

### 2 COMPONENTS

1	Component	Value	Quantity	
	Arduino	UNO	1	
1	Bread board	-	1	
	Jumper wires	M-M	10	
1	LED	-	1	

1

1

#### 3 TRUTH TABLE

The Truth Table for the identity is as follows:

$$(\mathbf{A}) \quad Y = b'd' + a'd'$$

a	b	d	Y
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

Table 1

# 4 ARDUINO CONNECTIONS

1) The connections taken from Arduino as Input and Output is as follows:

	Input	a	b	d	Y
ĺ	Arduino	3	4	5	6

Table 2

- 2) The input **a,b,c** here are connected to Arduino D3,D4,D5 pins.
- 3) The output  $\mathbf{Y}$  here are connected to Arduino D6 pins.
- 4) The values for these inputs are conncted either to GND or 5V according to the truth table.

# 5 CODE

The arduino code can be downloaded from the below link.

https://github.com/Rudrapratap1404/ Rudrapratap1404/blob/main/Arduino/src/ code.ino