VERIFICATION OF XOR GATE

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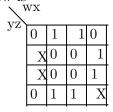
1

Contents

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

1 PROBLEM

(GATE CS-2002) Q.12 Minimum sum of product expression for f(w,x,y,z) shown in Karnaugh-map below is



- (A) xz + y'z
- (B) xz' + zx'
- (C) x'y + zx'
- (D) Noneoftheabove

2 COMPONENTS

Component	Value	Quantity	
Arduino	UNO	1	
Bread board	-	1	
IC	-	-	
Jumper wires	M-M	20	
LED	-	-	
Resistor	150ohms	1	

3 INTRODUCTION

the problem involves simplifying a Boolean function using a Karnaugh map. We need to identify groups of adjacent 1s in the map and use them to create the

1 simplest sum of product (SOP) expression that repre-

1 sents the function. The goal is to choose the correct expression from the provided options that accurately

1 represents the function's simplified form

1 4 TRUTH TABLE

The Truth Table for the above identities is ass follows: The Truth Table for the above identities is ass follows:

\mathbf{W}	X	Y	\mathbf{Z}	F
0	0	0	0	0
0	0	0	1	X
0	0	1	0	0
0 0 0	0	1	1	X
0	1	0	0	X 0 X 1
0	1		1	0
0	1	1	0	1
0 0 0 0 1	1	$egin{array}{c} 0 \\ 1 \\ 1 \end{array}$	1	$\begin{bmatrix} 1 \\ 0 \\ 0 \\ 1 \end{bmatrix}$
1	0	0	0	0
1	0	0	1	1
1	0	1	0	X
1	0	1	0 1	X 1 1
1	1	0	0	1
1	1	0	1	0
1	1	1	0	1
1	1	1	1	X

Table 1

by solving above k-map we get the equation (xz'+x'z)

5 ARDUINO CONNECTIONS

1)Connection at breadboard 1) The connections taken from Arduino as Input and Output is as follows: 2) The input **a,b** here are connected to

Input	a	b	f
Arduino	3	4	6

Table 2

Arduino D3,D4 pins.

- 3) The output **f** 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)attaching LED' cathod to GND

6 CODE

The arduino code can be downloaded from the below link.

https://github.com/madhu-addanki/FWC/tree/main/ide