VERIFICATION OF XOR GATE

RAMESHWAR SAINATH PAWAR (1032222095)

Contents

1 PROBLEM

(GATE CS-2OO2) Q.12 Minimum sum of product expression for f(w,x,y,z) shown in Karnaugh-map below is

yz \ wx	0	1	1	0
X	0	0	1	
X	0	0	1	
0	1	1	X	

(A) $xz + y'z$

(B) $xz' + zx'$

(C) $x'y + zx'$

(D) $None of the above$

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 simplest sum of product (SOP) expression that represents the function. The goal is to choose the correct expression from the provided options that accurately represents the function's simplified form

4 TRUTH TABLE

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

(A) $(x \oplus y) \oplus z = x \oplus (y \oplus z)$
where $Y1 = (x \oplus y) \oplus z, Y2 = x \oplus (y \oplus z)$

yz \ wx	0	1	1	0
X	0	0	1	
X	0	0	1	
0	1	1	X	

W	X	Y	Z	F
0	0	0	0	0
0	0	0	1	X
0	0	1	0	0
0	0	1	1	X
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	X
1	0	1	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