BOOLEAN LOGIC

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I. PROBLEM

The boolean logic realized by the logic circuit is
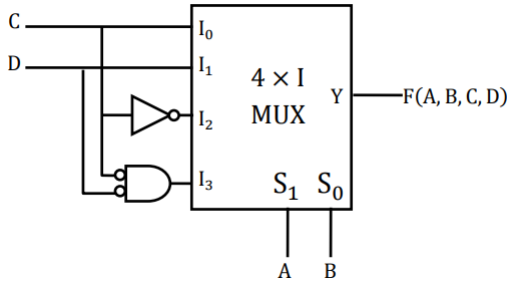

Fig. 1: cbgg

II. COMPONENTS

ARDUINO	1
BREAD BOARD	1
JUMPER WIRES M-M	20
7447IC	1
SEVENSEGMENT DISPLAY	1
RESISTOR	1

TABLE I

III. LOGIC

The logic is writen in the in the form

$$\bar{A}\bar{B}I0 + \bar{A}BI1 + A\bar{B}I2 + ABI3$$

$$I0 = \bar{A}\bar{B}; \; I1 = \bar{A}B; \; I2 = A\bar{B}; \; I3 = AB$$

S.NO	A	B	C	D	F
1	0	0	0	0	0
2	0	0	0	1	0
3	0	0	1	0	1
4	0	0	1	1	1
5	0	1	0	0	0
6	0	1	0	1	1
7	0	1	1	0	0
8	0	1	1	1	1
9	1	0	0	0	1
10	1	0	0	1	1
11	1	0	1	0	0
12	1	0	1	1	0
13	1	1	0	0	1
14	1	1	0	1	1
15	1	1	1	0	1
16	1	1	1	1	0

TABLE II: Truth Table

A	B	Y
0	0	C
0	1	D
1	0	$\bar{C}$
1	1	$\bar{C}\bar{D}$

IV. KARNAUGH-MAP

The equations to be solved by using the truth table

D) $F = \sum(2, 3, 5, 7, 8, 9, 12, 13, 14)$

$$CD$$

		00	01	11	10
	00	0	0	1	1
	01	0	1	1	0
AB	11	1	1	0	1
	10	1	1	0	0

TABLE-2: K-map

The equation expressed as the TABLE-2

$$F = A\bar{C} + \bar{A}BD + \bar{A}\bar{B}C + AB\bar{D}$$

V. ARDUINO CONNECTIONS

1)The 7447IC to 7 segment display connections as per the given below table-3

7447	$\bar{a}$	$\bar{b}$	$\bar{c}$	$\bar{d}$	$\bar{e}$	$\bar{f}$	$\bar{g}$
DISPLAY	a	b	c	d	e	f	g

TABLE III

2)The 7447IC to arduino connections as per the given below table-4

7447	A	B	C	D
ARDUINO	2	3	4	5

TABLE IV

VI. CODE

The code download by using the below link

https://github.com/prasaddeva287/FWC/tree/main/ASSEMBLY/CODES